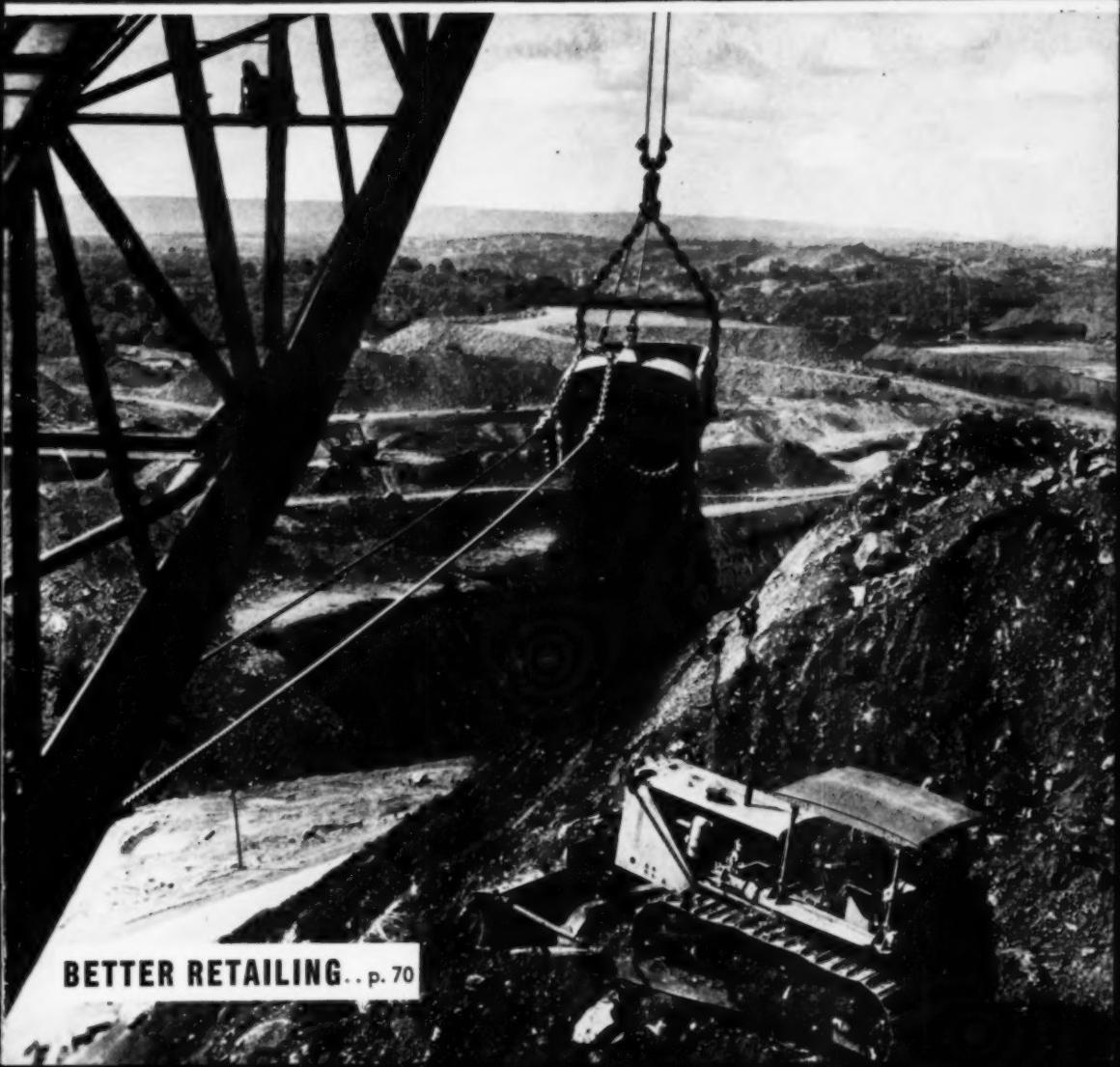


# Coal Age

A McGAH-HILL PUBLICATION

SEPTEMBER, 1949



BETTER RETAILING... p. 70

# WHY USE TWO WHEN ONE WILL DO!



## The "Dual Duty" Mine Locomotive

For the first time, a locomotive has been developed to do both of these jobs efficiently. One locomotive . . . the new Westinghouse "Dual Duty" mine locomotive . . . to perform all tractive service from the face to the main haulage siding. It's your sure bet for increasing efficiency and lowering operating costs.

When the locomotive is operating behind the loading machine from reel, low speed is necessary due to the short length of each movement . . . and the temporary tracks. Under this condition, the motors operate at maximum field strength to develop maximum tractive effort at low speed . . . with minimum power consumption.

When operating from trolley on more permanent tracks, in secondary haulage service, the motor field's power may be changed to obtain an increase in speed of approximately 40%, thus enabling the locomotive to make the longer movements at an economical speed—all this with no extra operations by the motorman.

Call your nearest Westinghouse office for full details, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-15130



**Westinghouse**  
PLANTS IN 25 CITIES . . . OFFICES IN 45 COUNTRIES  
*Mine Locomotives*



## World's oldest cord conveyor belt still cutting coal costs

THIS coal-loaded belt is the cord conveyor at Island Creek Coal Company. It carries coal from hopper cars out to coal barges on the Ohio River. This first commercial installation of the B. F. Goodrich-developed cord belt is now in its 12th year and has carried more than 14 million tons—over 1 million tons a year!

This B. F. Goodrich cord belt cost about 25% more than the ordinary fabric-type belts the mine had been using. The last three of these belts had lasted 3,800,000, 3,200,000, and 5,600,000 tons respectively. But, the B. F. Goodrich belt has now lasted from 2½ to 4 times as long, and is still on the job!

In a B. F. Goodrich cord ply each cord is completely surrounded by rubber, no cross threads tie them together. This independence of each cord more than doubles the thickness of impact cushion (see diagram, above). It allows the belt to "give," even under the shock of ton-size lumps dropped on it (as in the Island Creek operation).

Cord belts trough better, too. They have no stiff fabric carcass to resist troughing action. Cord belts resist the effects of moisture, mildew, and acid materials better—there is no "wick-ing" action from one cord to another. A transverse cord breaker, floated above

the main cord section, helps cushion impact, keeps the cover from stretching beyond elastic limits, and gives better adhesion of cover to carcass.

On the toughest coal-hauling jobs, whether above ground or underground, the BFG cord belt will do the job better at a cost-per-ton saving. Ask your local distributor, or write: *The B. F. Goodrich Company, Industrial and General Products Div., Akron, O.*

**B.F. Goodrich**  
RUBBER FOR INDUSTRY

# School opens for

"Take a good look  
at that drum you  
YOUNG FRICTION DEVILS  
and run for your lives  
wherever you see it!"



Friction Devils learn about lubrication the HARD way  
when they come up against Hulburst Quality Grease. That's  
why they're ABSENT from mining machinery after a  
Hulburst Engineer takes your lubrication troubles in hand.

**HULBURST OIL & GREASE COMPANY, PHILADELPHIA, PA.**  
*Specialists in Coal Mine Lubrication*

# **FRICITION DEVILS!**



## **Hulbert Quality GREASE**

Just learn this one simple lesson . . . HULBURT QUALITY GREASE is made solely and specifically for coal mine machinery — by men who KNOW coal mine equipment and how to lubricate it for most satisfactory, economical operation.

**HAZARD CO.**  
**NEW HAZAPRENE ZBF \*JACKET**  
 gives you greater flame-resistance...greater wear-resistance  
 ...longer, trouble-free life IN **SHOVEL CABLE**



ELECTRIC shovel cable has to take more kinds of punishment day in and day out than any other mining cable. With this new Hazaprene ZBF Jacketed shovel cable you'll find a solid answer to every sort of severe service problem you're up against.

Flexible, Hazaloy-coated conductors are fully protected electrically with Hazard's safer, longer-lived, heat-resistant insulation. Permanently colored' Okobestoprene tape (a non-fibrous material, Okonite-developed from asbestos and neoprene) is precision wrapped around each insulated conductor. It seals into a flame-resistant, moisture-resistant, non-rotting protective covering... provides greater flexibility and protection against mechanical damage, as well as lasting conductor identification. For still more cushioning qualities and flexibility... and moisture tightness at cable ends - Hazaprene fill is used in the conductor interstices in place of the usual fibrous materials. Tough outside protection that prolongs cable life is provided by a pressure-cured, unusually dense, reinforced, double layer Hazaprene ZBF Jacket. This Hazaprene ZBF Jacket provides greater resistance to flame and mechanical damage than was ever obtainable before. And, like other neoprene com-

\* **ZBF**  
**ZINC BORATE FORMULA**

Flame tests have shown that Zinc Borate imparts greatly increased fire-resistant properties to neoprene compounds with burning rates reduced by as much as 20% and weight losses by as much as 40%. Afterglow is materially reduced also. Millions of feet of cable protected by this type of jacket were used during the war by the Navy for special operating conditions to gain extra fire protection. Hazaprene ZBF Jackets mean not only greater safety because of unusual flame-resistance and lack of afterglow — but also longer life through increased resistance to abrasion, wear and tear.

pounded sheaths, it remains unaffected by moisture, oil, sunlight, acids, etc.

For longer-lived, safer shovel cable, it will pay you to get all the information about new Hazaprene ZBF Jacketed Shovel Cable from your Hazard representative today, or write us. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

**HAZARD**

**insulated wires and cables for every mining use**

6074

# Coal Age

Alfred M. Staehle, Publisher Ivan A. Given, Editor  
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 R. W. Davis, Sales Manager  
 World News Offices: London, Paris, Frankfurt, Tokyo, Bombay,  
 Melbourne, Rio de Janeiro, Mexico City

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**COAL AGE** (with which is consolidated "The Colliery Engineer" and "Miner and Minerologist") is published monthly on the 15th. Allow four to six weeks for receipt of subscriptions. All articles are indexed regularly by Engineering Index, Inc. COAL AGE's own index published annually may be had on request to the Editorial Department. Contents Copyright © 1949 by McGraw-Hill Publishing Co., Inc. All rights reserved.

**McGRAW-HILL Publishing Company, Inc.** James H. McGraw (1869-1948), President; H. H. McNeal, Jr., Vice President; W. H. McNeal, Vice President and Treasurer; Eugene Duffield, Senior Vice President; Publication Division; Nelson Bond, Vice President and Director; Advertising, John A. Garroway, Director; Harry C. Keeler, Director; Economics Department, T. F. Blackton Jr., Vice President and Director of Circulation.

**Subscription Information:** All communications about subscriptions should be addressed to the Director of

Circulation, COAL AGE, 210 South Dearborn St., Chicago 2, Ill., or 330 W. 42nd St., New York 18, N. Y. Please indicate position and company connection on all subscription orders. Subscription rates: United States and possessions \$5 for one year; \$8 for two years; \$10 for three years. Canada: \$6 for one year; \$10 for two years; \$12 for three years. Panama, American countries, \$6 for one year, \$10 for two years; \$15 for three years. South America, \$12 for one year; \$20 for two years; \$30 for three years. Single copies, U. S. and possessions and Canada, 50¢; Pan-

American countries, 25¢; all other countries, \$1.50. Entered as second-class matter Aug. 27, 1918, at the Post Office at Chicago, Ill., under the Act of March 3, 1879. Return postage guaranteed. Printed in the U. S. A. Cable Address: "McGraw Hill," N. Y. Member A.B.P. Member A.R.C.

**Publication office:** 210 South Dearborn St., Chicago 2, Ill. **Editorial and executive offices:** 320 W. 42nd St., New York 18, N. Y. **Branch offices:** 520 North Michigan Ave., Chicago 11, Ill.; 200 Madison St., San Francisco 7, Calif.; 120 Aldwych House, Aldwych, London, W. C. 2; Washington 2, D. C.; Philadelphia 1, Pa.; Cleveland 15, Ohio; Detroit 26, Mich.; Boston 10, Mass.; Atlanta 3, Ga.; Dallas 1, Tex.; 738-5 Oliver Bldg., Pittsburgh 22, Pa.; Dallas, Tex.

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Here is  
Plain PROOF...

That the

# CONCAVE SIDE

(U. S. Patent No. 1813698)

SAVES Transmission DOLLARS

When a straight-sided V-Belt bends around a pulley, three things are bound to happen.

(1) The top of the belt, being under tension, narrows. (2) The body of the belt, under compression, widens. (3) The sides of the belt bulge out.

These shape changes are inevitable. They are shown in figures 1 and 1-A, below.



Fig. 1  
Straight-Sided V-Belt.



Fig. 1-A  
How Straight-Sided V-Belt Bulges In Sheave-Groove.

Because this bulging belt does not fit the sheave groove, two facts become clear. (1) The belt will get excessive wear where it bulges—*shorter life!* (2) The whole side of the belt cannot uniformly grip the pulley—a loss in drive efficiency.

How different the V-Belt with the precisely engineered concave side (U.S. Patent No. 1813698)—the Gates Vulco Rope. As this belt bends it assumes a shape that exactly fits the sheave groove. (Figures 2 and 2-A, below.)



Fig. 2  
Gates Vulco Rope With Concave Side.



Fig. 2-A  
No Side Bulge. Precise Fit In Sheave-Groove.

Two savings result. (1) The Gates Vulco Rope wears evenly—*longer life!* It's entire side-wall grips the pulley—no slip—*full delivery of power!*



You can actually feel the sides of a belt change shape as the belt bends.



*Gates*  
VULCO ROPES

The Mark of SPECIALIZED Research

### The Concave Side is MORE IMPORTANT NOW Than Ever Before

Because the sides of a V-Belt are what actually drive the pulley it is clear that any increased load on the belt means a heavier load that must be transmitted to the pulley directly through the belt's sidewalls.

Now that Gates SPECIALIZED Research has made available to you SUPER Vulco Ropes—carrying fully 40% higher horsepower ratings—the life-prolonging Concave Side is naturally more important in conserving belt life today than ever before.

813

**GATES VULCO ROPE DRIVES**  
IN ALL INDUSTRIAL CENTERS

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at the U. S. and  
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THE GATES RUBBER COMPANY

DENVER, U.S.A.

"The World's Largest Makers of V-Belts"

# LOOK THESE BIRDS OVER

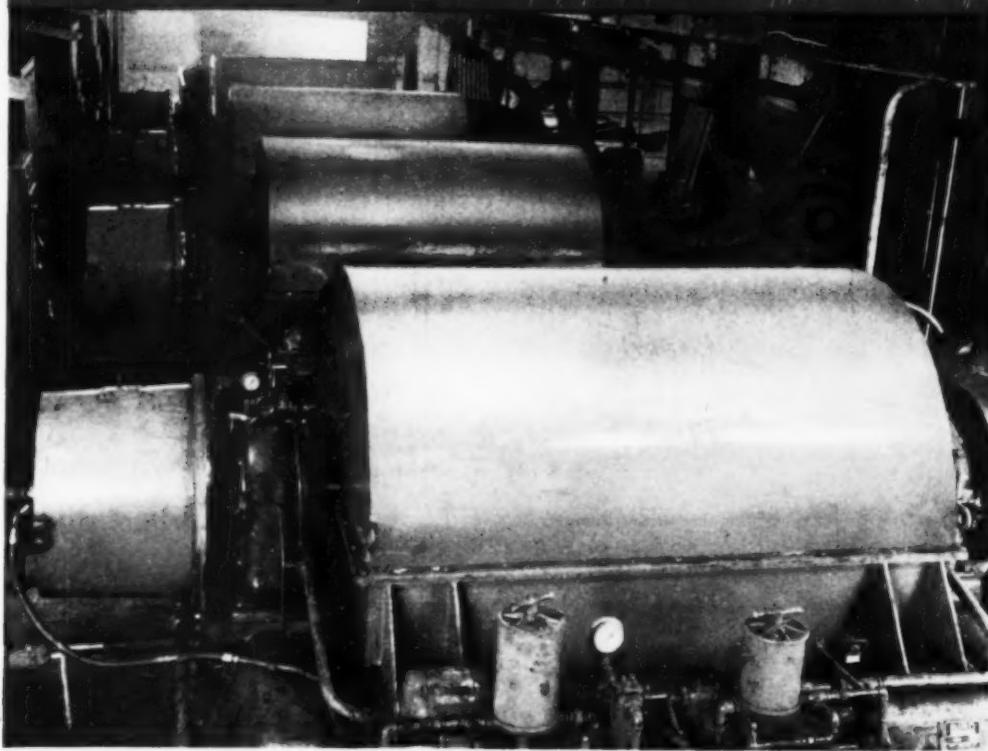
when you start thinking how  
to dry your fine coal

Don't resign yourself to a whole series of expensive operations. The BIRD Coal Filter does the whole job — gets the coal as dry or drier than any series of complex equipment — gets the water so clear that you can effect a closed circuit. One BIRD handles up to a ton of minus  $\frac{1}{4}$ " plus 0 coal per minute. The feed can contain as little as 25% solids.

Ask us to mail you  
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The BIRD runs continuously for months without overhaul.  
Operation is entirely automatic.

**BIRD MACHINE COMPANY • South Walpole, Massachusetts**





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— with long lasting Texaco Olympian Grease. It reduces frictional  
"drag" . . . cars start easier, run more smoothly, even at low  
temperatures. Your bearing maintenance costs will come down.



# TEXACO LUBRICANTS



**DO THIS:**

**Charge hydraulic systems with  
Texaco Regal Oils (R & O)**

**GAIN THIS:**

**Freedom from costly stoppages due  
to rust and sludge...longer pump life**

You can avoid the two main causes of hydraulic system stoppages—rust and sludge—by using *Texaco Regal Oils (R & O)* as your hydraulic mediums. These are finest quality, turbine-grade oils which contain additives that 1) inhibit oxidation (the cause of sludge), and 2) "plate" metal parts against rust-forming moisture. In addition, they are especially processed to prevent foaming.

Thus, *Texaco Regal Oils (R & O)* keep hydraulic systems clean . . . assure smooth, trouble-free operation. Maintenance costs are lower because fewer cleanings, drainings and overhauls are necessary . . . pumps last longer.

No need to "cut back" *Texaco Regal Oils (R & O)*. You can get them in the required viscosities for every type and size of hydraulic mechanism and all operating conditions. Leading makers of hydraulic equipment recommend *Texaco Regal Oils (R & O)*, and many ship their units charged with them.

Let a Texaco Lubrication Engineer help you get greater efficiency and economy in the operation of *all* your machinery. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, *National Sales Division, Dept. C, 135 East 42nd Street, New York 17, N. Y.*

**For the Coal Mining Industry**

# Announcing.. A COMPLETELY NEW

ALLIS-CHALMERS

MODEL



Weight: 8,500 lbs.

Brake H.P.: 34.7



**Engineered from the ground up  
—to bring you BIG grader design  
and performance advantages**

*Big in  
Performance*

- PROPER WEIGHT DISTRIBUTION — handles bigger loads . . . front-end stability.
- "ROLL-AWAY" MOLDBOARD—less power required to move more material at faster speeds.
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● TUBULAR FRAME AND DRAWBAR — strong, shock absorbing, better visibility, more working clearance.

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Economy*

economical to operate — fuel tank holds day's supply.

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● ALL-WELD CONSTRUCTION — strong, long life, stands up under tough service.

● RUGGED POWER

— famous Allis-Chalmers gasoline tractor engine; easy to service,

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# LOW-COST MOTOR GRADER

with  
Exclusive

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Tandem

Drive

*Big in  
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- **FULL VISIBILITY** — no obstructions, operator can see full blade while sitting or standing.

Upper half of cab quickly lifted off or replaced.

- **GREATER OPERATOR COMFORT** — roomy platform, comfortable seat, easy to handle.



- **HYDRAULIC BLADE LIFT** — fast, positive, trouble-free; only two control levers.

- **HANDY CONTROLS** — blade angle set from platform; throttle, shift lever, starter, conveniently located next to seat.

Scarfier location provides extra down pressure and allows controlled steering.

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for

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Dealer

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- All-View Cab
- Snowplow
- Various Other Accessories

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Bethlehem Bolts for  
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make the specials  
we need. Good  
delivery, too.  
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for  
rough  
stuff



Pit and quarry truck operators will find it pays to **BUY** and **SPECIFY** Goodyear's Hard Rock Lug for their rigs. This extra-husky, extra-tough off-the-road tire is specially designed for premium performance on rock and other tire-punishing jobs.

Every feature of this outstanding work tire is job-tailored to give you longer tire life—lower cost-per-mile. The lug bars are massive to armor the tread

and sidewall against cuts and rips—the undertread is extra-thick, extra-tough to protect the carcass against bruising—the tread design is universal, self-cleaning, to provide equal pulling power forward or reverse.

Try the super-tough Hard Rock Lug on your roughest runs. Find out for yourself why, *year after year, more tons are hauled on Goodyear tires than on any other kind.*



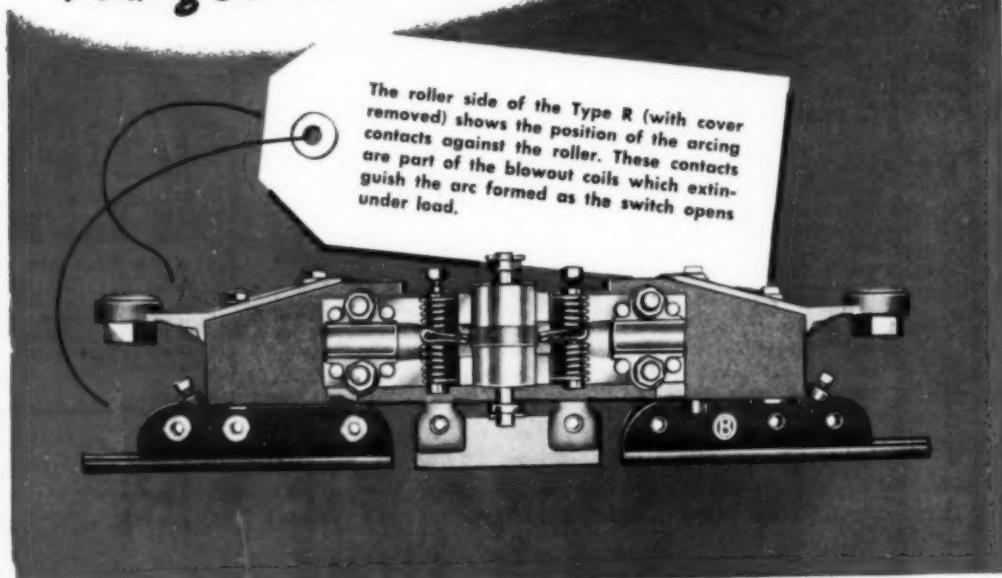
# GOOD YEAR

truck tires



O-B's Type-R Section Insulator Switch provides an even, one-level path for the current collector. The wire is gripped along the upper lobe by the end runners of the switch. The center runner, a copper bar, can be quickly adjusted to maintain the same level as the wire. The switch, a roller-type, has magnetic blowout coils that safely break the circuit in an emergency. These coils quickly and harmlessly extinguish the arc formed when the switch is opened under load.

You get continuous wire smoothness



The roller side of the Type R (with cover removed) shows the position of the arcing contacts against the roller. These contacts are part of the blowout coils which extinguish the arc formed as the switch opens under load.

*PLUS load breaking safety with...*

## O-B'S TYPE-R SECTION INSULATOR SWITCH

Heavy arcing and wire burning are a thing of the past when you install O-B's Type-R Section Insulator Switches. The collector glides smoothly through this wire-level switch without "bumps, blows or burns." Heavy, wire-encircling fittings, source of most arcing and burning, are completely eliminated.

But you get more than just a wire-smooth underrun with the Type-R switch. You put added safety in your power distribution system when you install this switch. In an emergency,

you can break both feeder and trolley circuits **under load**—with complete safety.

The new Type R, roller-type switch, contains a fool-proof magnetic blowout. When the switch is opened under heavy load, the arc formed is immediately and harmlessly extinguished by the magnetic blowout.

When planning new overhead trolley systems, or when revamping your present system, be sure to include O-B's new Type-R Section Insulator Switch in your plans.

*O-B makes a complete line of Smooth-Underrun Fittings  
that give longer wire and collector life—and let  
your locomotives operate safely at higher speeds.*





Straight-Flow Port Design reduces fluid turbulence to a practical minimum.



Seat Rings of end-seated type are screwed into the body.



Sure-Grip Malleable Handwheel for non-slip gripping even with heavy gloves.



Brass Liner on Glands assures greater resistance to corrosion and scoring.



T-head Disc-to-Stem connection on OS&Y types provides stronger connection, prevents loosening of disc by corrosion.

# **WALWORTH**

## **iron body gate valves**

with screwed or flanged ends



For complete information on these new Walworth Iron Body Valves, see your local Walworth distributor, or write for bulletin 106.

### *... 8 Outstanding Features ...*

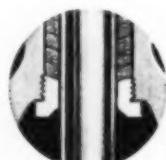
## **WALWORTH**

### **valves and fittings**

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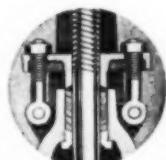
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD



Bronze Back-Seat Bushings in bonnets of OS&Y valves.



Solid Web Type Disc in OS&Y valves for greater strength and longer service.



Hinged Gland Eye-Bolts on OS&Y valves permit faster, easier repacking under full pressure.



Illustrated is one of the features of the new TIREX Shuttle Car Cable that will save you money. The feature is the tight adhesion between jacket and conductors. When we stripped back a narrow piece of the jacket, small pieces of the conductor insulation actually tore away with the Selenium Neoprene Armor.

You need that adhesion in your shuttle car cables because without it the conductors can come loose from the jacket. When that happens, the conductors get twisted inside the jacket and nothing anyone can do will take the twists out. From this point on it is only a short time till failure occurs.

Because of the ribbed shape of the conductors in the new TIREX Shuttle Car Cable the conductors are held firmly by the jacket and resist any tendency to twist inside the jacket. These ribbed or gear-shaped conductors offer more than 25% more surface to the jacket.

The jacket of this new TIREX Shuttle Car Cable is the famous "Cured-In-Lead" Selenium Neoprene Armor common to all TIREX Cables. Like other TIREX Cables for underground mine service, this new shuttle car cable bears the first Approval Number of the Department of Mines, Commonwealth of Pennsylvania — P-101.

When you need cable for your shuttle cars or any other heavy duty service be sure you specify TIREX. Only TIREX has the "ribbed" conductors.

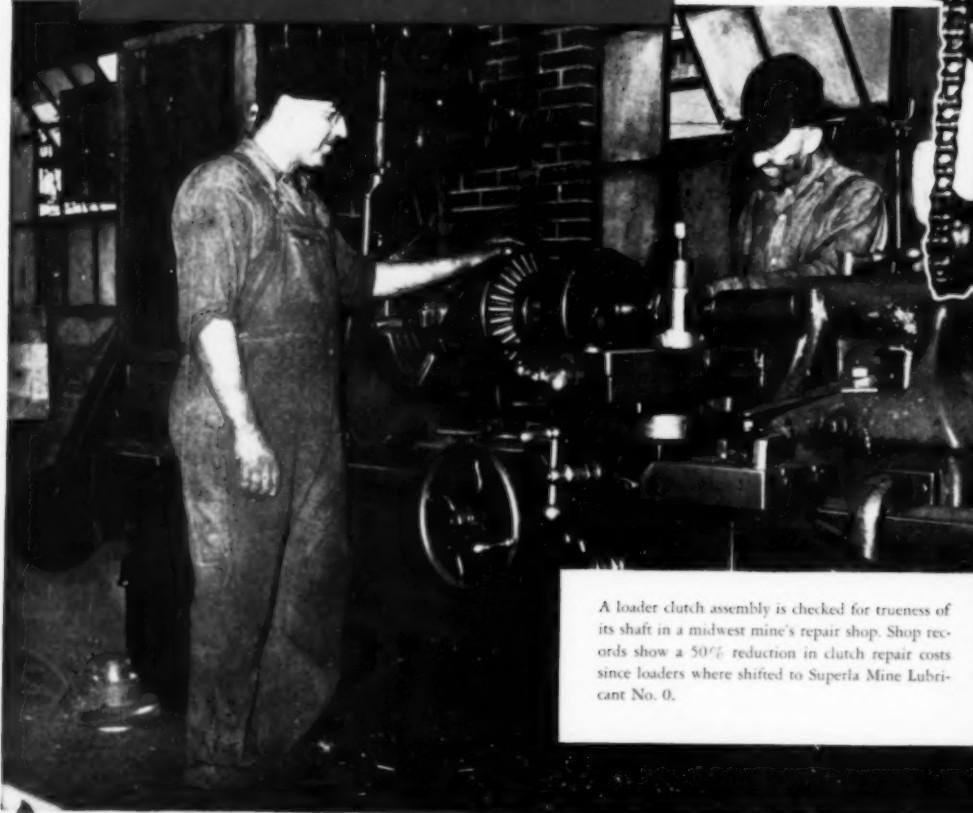
# Simplex-Tirex

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

**Here's** VISIBLE EVIDENCE . . .

## SUPERLA

### Mine Lubricant No. 0



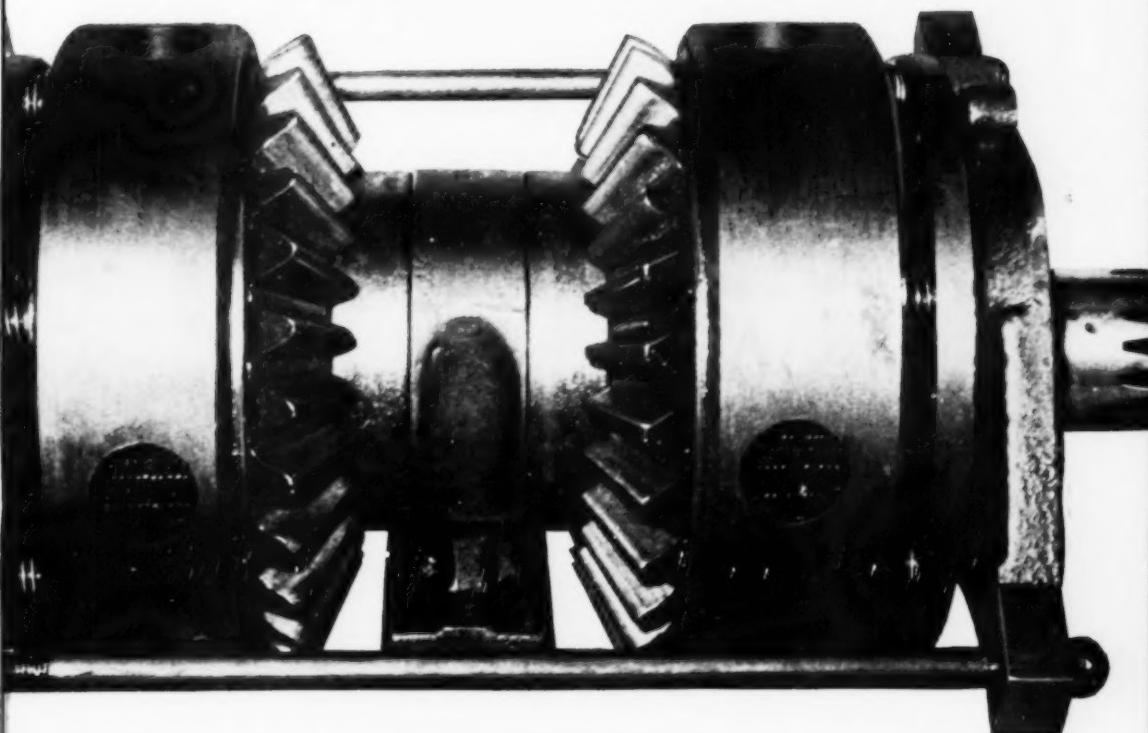
A loader clutch assembly is checked for trueness of its shaft in a midwest mine's repair shop. Shop records show a 50% reduction in clutch repair costs since loaders were shifted to Superla Mine Lubricant No. 0.



**STANDARD OIL COMPANY (INDIANA)**

ST

# .of better loader lubrication.



This clutch assembly, from a Goodman loader in a midwest mine, has seen 23 months' hard service. The unit has not been cleaned; nevertheless, it is completely free of sludge and deposits. The clutch plates are clear of carbon. Here is visible evidence of the superior lubrication provided by Superla Mine Lubricant No. 0.

What benefits resulted from this cleaner and safer lubrication? Loaders stayed on the job longer, loading out high tonnage for this mine. Clutch operation was efficient and dependable—machines were easy

to handle. Clutch repair costs were reduced by more than 50%.

You can look forward to improved loader operation and lower maintenance costs by shifting, now, to Superla Mine Lubricants. Grades are available for both grease- and oil-lubricated cutters and loaders. If your mine is located in the Midwest, write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the services of the Standard Oil Lubrication Engineer nearest you.

**STANDARD OIL COMPANY (INDIANA)**



*The Coal Cutter's* "HANDYMAN"

# JEFFREY SHORTWALL TRUCK



Here's a rubber-tired vehicle specifically designed for hauling SHORTWALL cutting machines in trackless mining operations. Aside from the steering this unit features full hydraulic control. Two wheel steering by steering wheel. It has a two-speed gear box with neutral and drive is by two hydraulic motors in parallel.

This truck has a tilting pan that facilitates loading and unloading the cutting machine. Machine is loaded and unloaded under its own power. Truck has a tramping speed of three miles per hour.

A truck of high utility value (can also be used for supplies) that is worthy of your consideration. Consult a Jeffrey Engineer on your cutting machine transportation problems.

The two views on this page show the truck with and without the cutting machine.



M

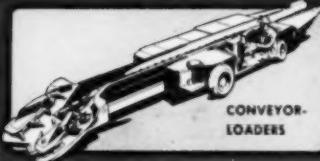
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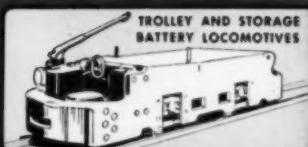
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MACHINES



CONVEYOR-  
LOADERS



TROLLEY AND STORAGE  
BATTERY LOCOMOTIVES



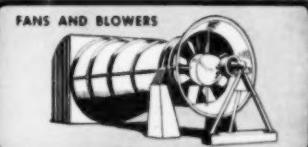
DRILLS AND DRILLING MACHINES



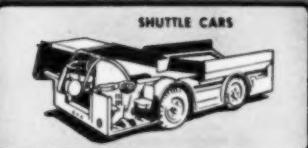
UNIVERSAL  
COAL CUTTERS



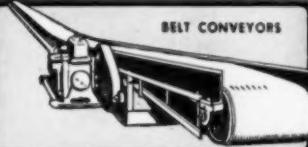
SHORTWALL COAL CUTTERS



FANS AND BLOWERS



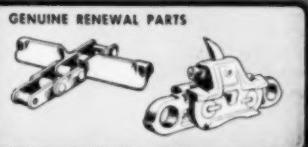
SHUTTLE CARS



BELT CONVEYORS



CHAIN CONVEYORS



GENUINE RENEWAL PARTS

# JEFFREY

## EQUIPMENT FOR COAL MINES

*and*

## GENUINE RENEWAL PARTS



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CLEVELAND 11,

Rockefeller Building

DENVER 7,

Ernest & Channer Bldg.

DETROIT 13,

500 St. Jean Avenue

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HUNTINGTON 14, W. VA.

County Bank Bldg.

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Large illustration shows operator unloading a SHORTWALL cutter under its own power at a new place. Insert shows truck hauling cutting machine to new place. We will be glad to go into detail regarding this handy unit for trackless mining.

"MIGHT BE A LITTLE OVERLOADED, BUT

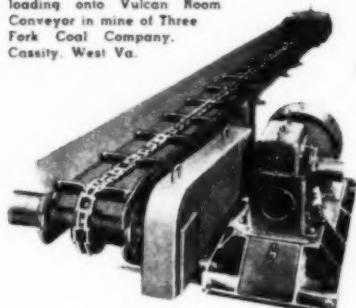


## Vulcan Chain Conveyors ARE BUILT TO TAKE IT"

We don't recommend piling the coal up quite so heavily—even on a Vulcan Chain Conveyor—as the boys at the Three Fork Coal Company did when the photograph reproduced above was taken. But we know it often happens, so we build an extra margin of strength into every working part to take care of just such extra heavy loads. If anything MUST go it's usually the shear pin in the head sprocket, which can easily be replaced.

Write us regarding any requirement for underground conveyors—either Chain or Shaking Chute. We manufacture both types in a wide range of sizes, together with a complete line of Chutes, Rollers, Jacks and other modern accessories. Illustrated bulletins mailed promptly on request.

ABOVE: Vulcan Face Conveyor loading onto Vulcan Room Conveyor in mine of Three Fork Coal Company, Cassity, West Va.



VULCAN ROOM CONVEYOR with fully enclosed speed-reducing drive unit and electric motor of any required type or size.

## VULCAN IRON WORKS

Established 1849

Main Office and Works WILKES-BARRE, PA., New York Office 50 Church St.

Heavy Duty Electric Hoists  
Self Contained Hoists  
Scraper Hoists  
Car Spotting Hoists  
Room Hoists

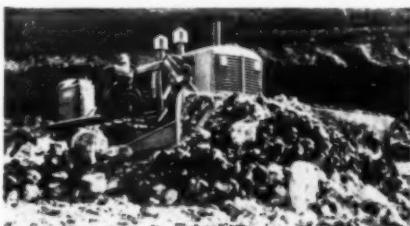
Shaking Chute Conveyors  
Chain Conveyors  
Cast Steel Sheaves and Gears  
Cages, Skips and Gunboats  
Coal Preparation Equipment

Steam Locomotives  
Diesel Locomotives  
geared and electric drive  
Gasoline Locomotives  
geared and electric drive

Load Carrying Larries  
Rotary Kilns, Coolers and Dryers  
Crushing Rolls and Pulverizers  
Briquetting Machines  
Ball, Rod and Tube Mills



GM Diesel-powered Koehring 605 dragline with 1½ yd. bucket, loads shale in Euclid bottom dump. The GM Diesel-powered Euclids haul 17 yard loads up a 15° grade climbing out of the cut.



Allis-Chalmers HD-19 pulling a 12-ton "rooster" scraper heavy shale off rock vein in final stage of stripping at National City, Michigan. A General Motors 6-71 Diesel powers the HD-19.



GM Diesel-powered Euclid front-end loader, pulled by Allis-Chalmers HD-19 tractor, teams up with 7 GM Diesel-powered Euclid bottom dumps to move as much as 150,000 yards of earth a month.

## 100% GM DIESEL POWER—"100% PLEASED" Says the Contractor

Stripping a 55-foot overburden of Michigan's hard clay, heavy soil and shale to bare gypsum deposits takes plenty of rugged, reliable power. That's why A. S. Leffler, contractor, standardizes on General Motors Diesels. Leffler operates 16 of them.

"We get more work done at about one-half the cost," says Mr. Leffler. "We went to the one make of engine 100% because of our previous satisfactory experience. Standardization on GM Diesels also helps keep our parts inventory low."

Remember all GM Series 71 Diesels have the same bore and stroke. Thus most wearing parts are interchangeable between engines of different sizes. Result: lower parts inventory, less time out for repairs, a big reduction in maintenance costs.

No wonder so many operators rely on these brawny 2-cycle Diesels to speed production and trim costs. You too, will find it pays to specify GM Series 71 Diesels. Get the facts from your local GM Diesel distributor.

### DETROIT DIESEL ENGINE DIVISION

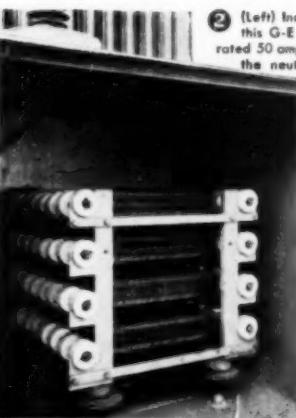
SINGLE ENGINES...Up to 200 H.P.    DETROIT 28, MICHIGAN    MULTIPLE UNITS...Up to 800 H.P.  
GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

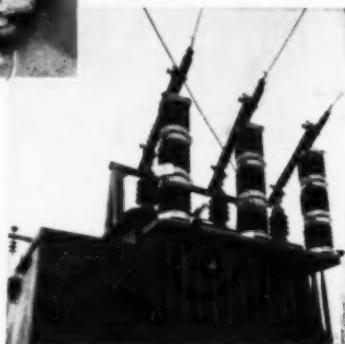


*"We're sold  
on it!"*

"THAT'S WHY WE'RE  
INSTALLING THE SAME  
SETUP IN ANOTHER STRIP MINE."



1 (Left) Here is the Harmattan Mine's G-E outdoor-type, skid-mounted unit substation, rated 1500 kva, which steps down incoming power from 33,000 to 4160 volts. Because the G-E power distribution system keeps the voltage drop to a minimum, the equipment can operate farther from the substation, thus resulting in less frequent moving of the substation.



2 (Left) Included in the unit substation is this G-E Type EW grounding resistor, rated 50 amperes continuous, for grounding the neutral of a 4160-volt circuit. It eliminates the hazard of high-voltage shocks resulting from undetected shorts.

3 (Below) Installed on the 33 kv incoming line of the unit substation, these 3 sets of G-E Thyrite station-type lightning arresters are each rated 34.5 kv. Compact and of simple design, these G-E arresters have a record of excellent protective efficiency in preventing system disturbances or outages.

GENERAL ELECTRIC

## Complete General Electric power distribution system helps minimize shutdowns, reduces delays and accidents, cuts costs, says Mr. L. E. Briscoe, Electrical Engineer of Fairview Collieries.

At the new coal-stripping operation of the Fairview Collieries Corporation at the Harmattan Mine near Danville, Illinois, a complete, co-ordinated General Electric power distribution system was recently installed, comprising unit substation, cable, and cable-skid switch houses. As a result, according to Mr. L. E. Briscoe, electrical engineer in charge, "We are sold on this type of power distribution system and are installing the same setup in another strip mine that we are modernizing."

Let Mr. Briscoe explain why:

"A dependable power distribution system," he says, "helps keep shutdowns to a minimum, which is the key to successful dragline operation. By using cables instead of overhead lines, power lines can be kept out of the way and advance with the operating equipment. This eliminates many accidents and delays, and provides big savings in money."

"The flexibility of our G-E system is due to (1) use of standardized equipment, (2) use of polarized couplers which permits interchanging cables, and (3) the ease and speed with which the cables can be interchanged.

"The G-E power distribution system also provides for testing ground continuity of each 4160-volt incoming and outgoing cable on the hill-type cable skids. This assures that the ground protection system is always working, does away with testing the cables by bells or other methods, and saves us valuable time."

Advantages such as these—plus additional savings in power costs and relocating time and costs—can be yours with a completely integrated G-E power distribution "package." It's worth your while to check the facts with a G-E mining specialist. Call him today. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*



4 (Above) The Harmattan Mine uses 9 of these G-E portable, cable-skid switch houses to serve its surface mining equipment. They provide maximum portability and convenience plus more selective tripping. For safety, the G-E system is designed to have at least two protective breakers between each piece of operating equipment and the unit substation.

5 (Below) This interior view of one of Harmattan's hill-type cable-skid switch houses shows the power circuit breakers, rated 25,000 kva interrupting capacity, 3 phase, 60 cycle, 5 kv maximum; together with a 6-volt battery and a G-E Type SB-1 switch for testing ground continuity.



6 (Above) G-E cable-skid switch houses are metal-enclosed and sturdily built to provide maximum service continuity under conditions such as shown here. At Harmattan, G-E portable cable—all of the same type for easy interchangeability—is used exclusively.



# AMERICAN

## CONTINUOUS VACUUM FILTER

**Stops Stream Pollution—Economically!**



What's the situation in your state now about allowing solids to pass down stream from the washing? Any legal restrictions?

Why not stop this stream pollution positively . . . at low cost . . . and at the same time reclaim water for reuse.

For this anti-pollution job, we recommend the American Continuous Vacuum Filter which offers exceptionally high filtering capacity for floor and building space required. It's a low speed, automatic unit requiring little attention and maintenance. Numerous companies already have this filter, reporting excellent results from the standpoint of both efficiency and economy.

Word to our nearest office about your stream pollution and fine coal dewatering problems will bring prompt attention.

*"40 years of filtration experience . . . the safeguard behind all Oliver United products."*

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# MACK TRUCKS

## *haul*

# Profitable Payloads

10 TO 50 TONS

Gasoline or Diesel • Four or Six Wheels  
Truck or Tractor

● In pit and strip mining, in quarrying and excavating work — wherever an off-highway, earth-moving job calls for rugged strength and stamina — there's a Mack truck *sized right* and *built right* to do the job as only a Mack can do it — with masterful efficiency, bed-rock economy, and enduring reliability.

Power and brawn for the heaviest loads! Maneuverability and ease of control for fast loading and unloading! Traction and flotation for the most slippery mud or sand! These are the qualities that assure greater profits through greater output. You get them all with Mack trucks because only Mack offers so many outstanding and exclusive features of design and construction.

We'll be glad to send you detailed information on these profit-building features, together with complete specifications on any or all of the Mack models shown here. Write for copies of our catalogs.

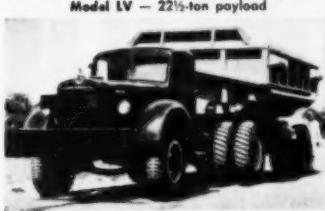
IT'S PART OF THE LANGUAGE:

Built Like a *Mack* Truck

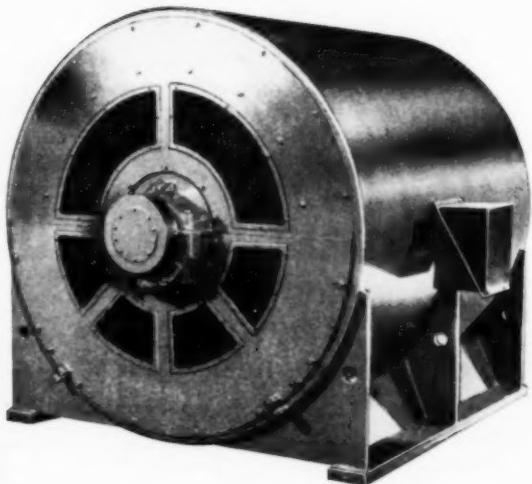
Model LRSW tractor  
— 50-ton payload



Mack Trucks, Inc., Empire State Building,  
New York 1, New York. Factories at Allentown, Pa.  
and Cleveland, Ohio. Branches and Agents  
in all principal cities for service and parts.  
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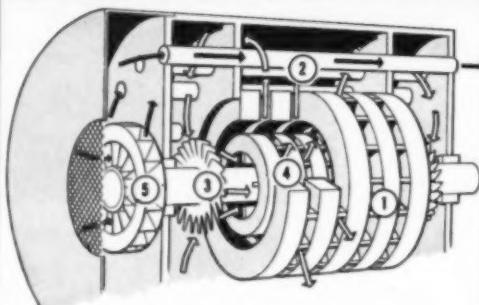


**TUBE-TYPE  
TOTALLY-ENCLOSED  
FAN-COOLED  
MOTORS!**



# INSTALL indoors or OUT!

## How Tube Cooling Works



Stator core (1) is surrounded by tubes (2). Internal fans (3) circulate air through ducts (4) in rotor and stator and around tubes, transferring heat to tubes.

External fan (5) drives outside air through tubes, removing heat and keeping tubes clean. All electrical parts are enclosed. Dirt cannot enter.

- Dirt-proof and corrosion-resistant
- Heat exchanger is practically self-cleaning
- Simple self-contained cooling system—sizes from 75 to several thousand horsepower

WHEREVER DUST, DIRT, fly ash, rain and snow, smoke, or corroding fumes keep motor maintenance costs high, this Allis-Chalmers tube-type motor will cut maintenance sharply.

All electrical parts—including stator core—are enclosed. Simple heat transfer system keeps temperatures well within rated limits. Cleaning is rarely needed because air passages are unrestricted. Air flow through the straight tubes removes foreign matter.

Important savings have been proved in three years of field operation. Sizes from 75 hp and up. Also explosion-proof designs. For complete information, outline your requirements to your A-C Sales Office, or write for Bulletins 05B7150 and 51R7149.

A-2610

ALLIS-CHALMERS, 968A SO. 70 ST.  
MILWAUKEE, WIS.

# ALLIS-CHALMERS



How many oils and greases do you use at the face?

You need only two!



## 1. Gulf Mining Machine Lubricant B

for lubrication - it does the job of 2 or 3 other lubricants

## 2. Gulf Journal Oil B

for hydraulic systems

With Gulf Mining Machine Lubricant B and Gulf Journal Oil B you can service almost any mining machine—you eliminate as many as 4 oils and greases! Thus your lubricant storage and handling are greatly simplified and you avoid application errors at the face.

Gulf Mining Lubricant B and Gulf Journal Oil B not only do the job of several other oils and greases, but do it better! Gulf Mining Machine Lubricant B has a heavy body to insure less leakage from gear cases; exceptional adhesiveness that prevents throwoff or channeling; higher lubricating value that insures less wear; and it resists the washing action of water.

Gulf Journal Oil B gives outstanding protection to hydraulic pumps—maintains system efficiency!

Call in a Gulf Lubrication Engineer today and ask him to explain in detail how these two Gulf

quality products for cutting and loading machines can give you effective help in your efforts to increase tonnage and reduce costs. Write, wire, or phone your nearest Gulf Office.

Gulf makes available top quality passenger and truck tires — ask your Gulf representative

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## You Hear It At The Face And In The Front Office



**"ROCKMASTER "16"** is the greatest improvement in blasting methods since ATLAS introduced milli-second blasting!"

IN UNDERGROUND WORKINGS, pits, quarries, and construction jobs you hear a lot of enthusiastic talk from men and management about the advantages of the ROCKMASTER "16" Blasting System.

For example, blasting men at the face talk about better breakage, savings in dynamite, better control of throw, quicker return to the face. And mining men talk about a safer roof—the result of the lack of vibration typical of ROCKMASTER "16" shooting. When this talk finds its way to the front office, it is quickly translated into greater safety for workers, less expensive handling and milling of rock, less degradation of coal, better rock-production at less cost.

Blasters everywhere—underground and on the surface—find that ROCKMASTER "16" helps them produce more material per pound of explosive. Sixteen periods—a wide choice of short or long milli-second delays—add up to better control over throw, back-break, and material size. And underground, sixteen delay periods firing in 550 milli-seconds mean less dust and a quicker return to the face...less strain on timbers and roof.

Ask your Atlas representative for the new ROCKMASTER booklet explaining how ROCKMASTER "16" fits into your operations.

ROCKMASTER "16" TIMINGS	
Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

ROCKMASTER: Reg. U. S. Pat. Off.

# ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco



LOOK TO P&H FOR WORLD VALUE

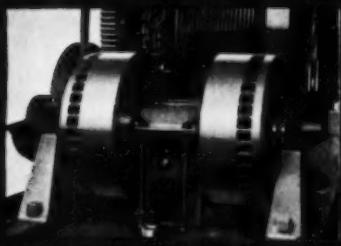
# "King of Swings"

## wherever big shovels work

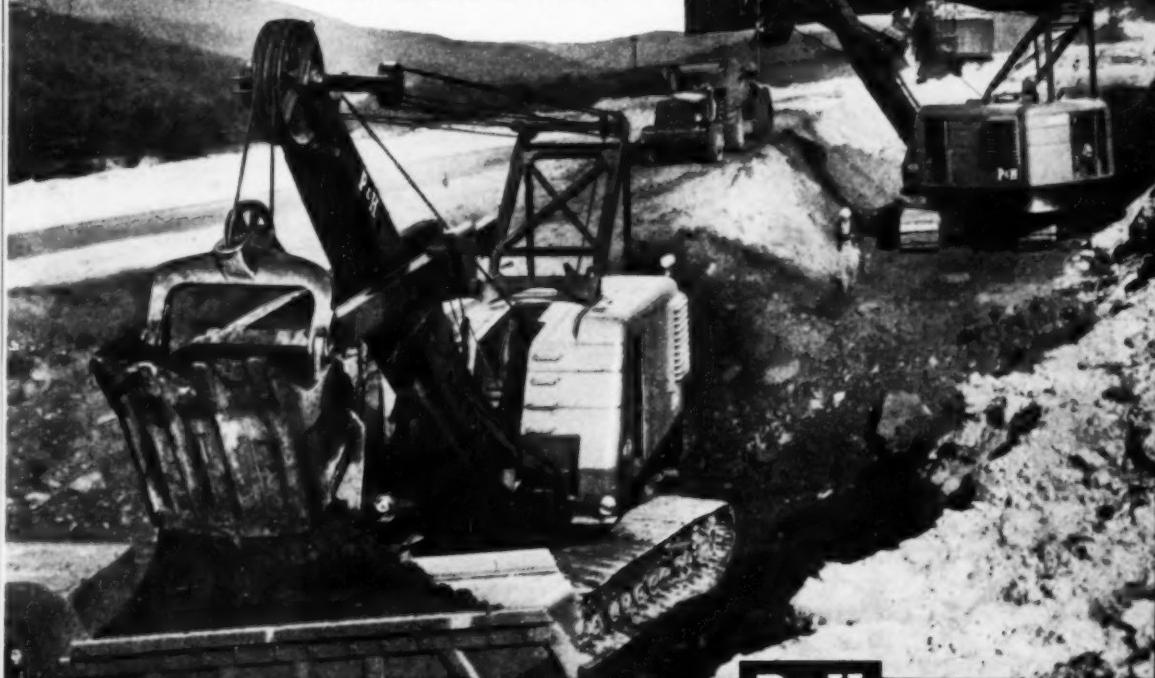
In the entire field of large excavators, there's nothing to compare with the "Magnetorque" swing on the P&H Model 1055.

It's faster — up to 20% faster! That means more yards per shift — greater earning power. It's smoother — with "cushioned" starts and stops — easier on shafts, bearings and gears. It's more dependable — insures steadier operation — no time out for adjustments and replacement of linings. Best of all, it's simple — control system is free of complicated switch gear — easily understood. All this adds up to trouble-free operation at absolute minimum cost.

Ask any owner of a P&H 1055. He'll tell you, "It's the slickest swing in the business!"



P&H 1055-3½ YD. SHOVEL



P & H

SEE A P&H 1055 ON THE JOB — and you'll see what no other shovel can do. The best way to compare is to see one of these machines at work. Ask for the location of the nearest P&H office.

# NOW 3 in the SINCLAIR to meet every



## SINCLAIR

YOUR NEAREST SINCLAIR AGENT WILL GLADLY ARRANGE

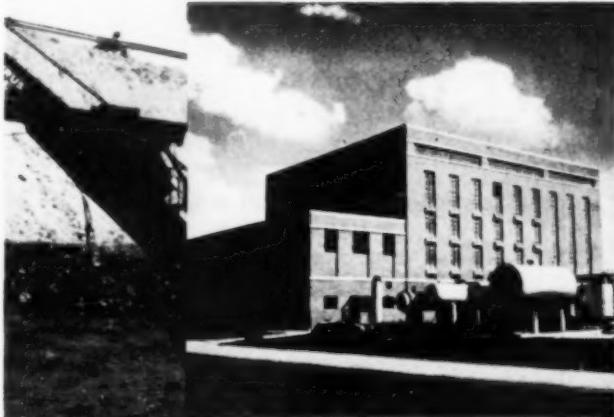
# TENOL FAMILY operating requirement

Two new Tenols now make it possible to meet every operating requirement with one of these superior oils. New—**SUPER TENOL** and **TENOL EXTRA** are designed to take care of new conditions and "heavier" duty service to which engines are being subjected.

**SUPER TENOL** meets the engine test requirements of U.S. Army Spec. 2-104 B, Supplemental List 1. It accepts the challenge of continuous, *extra-hard* service and also thwarts cold engine sludge caused in diesels and gasoline engines by long idle and stop-and-go operation. It helps solve the problems caused by the use of improper or high sulphur fuels.

**TENOL EXTRA** qualifies under U.S. Army Spec. 2-104 B, Supplemental List 2—and the requirements of Caterpillar Series 2 oil for supercharged diesels, abnormally heavy duty operation and high sulphur fuel.

Use **TENOLS** as maintenance tools to extend overhaul intervals, engine life.



This Pilot Plant, part of the great Sinclair Research Laboratory at Harvey, Ill., provides space for six miniature operating replicas of commercial-sized refinery units. Continuous research explains the high quality of **TENOL** and other Sinclair Oils.



Making a study of crystal structure of catalysts, this Sinclair researcher at Harvey uses physical chemistry to develop refining techniques in a never ending effort to bring industry better petroleum products at lower costs.

## HEAVY DUTY LUBRICANTS

FOR LUBRICATION COUNSEL, OR YOU MAY WRITE TO SINCLAIR REFINING COMPANY, 630 FIFTH AVE., NEW YORK 20, N.Y.



## Bigger Value for Every Job

# CHEVROLET ADVANCE-DESIGN TRUCKS



It takes a truck operator to really evaluate a truck. Yes, the man behind the wheel is the one who can best appreciate the worth of powerful yet economical performance . . . extraordinary load capacity . . . lasting quality, ruggedness and handling ease. He's the one who recognizes the advantages of new, improved features—of greater comfort and convenience for the driver. And these men in the drivers' seats—these experienced truck operators across America—know that Chevrolet trucks deliver more of the value factors they want. They know that Chevrolet trucks cost less to operate, less to maintain, and have the lowest list prices in the entire truck field. That's why they use more Chevrolet trucks than any other make! Your Chevrolet dealer will give you the facts in detail!

CHEVROLET MOTOR DIVISION, General Motors Corporation,  
DETROIT 2, MICHIGAN

### TOP-VOLUME PRODUCTION BRINGS YOU TOP-VALUE FEATURES!

Chevrolet's new 4-SPEED SYNCHRO-MESH TRANSMISSION offers quicker, quieter and easier operation. Double clutching is eliminated because the gears are always in mesh. Faster shifting maintains speed and momentum on grades. Available in series 3800 and heavier duty models.

Chevrolet's power-packed VALVE-IN-HEAD ENGINES provide improved durability and efficiency as well as the world's greatest economy for their size!

Chevrolet trucks have the famous CAB THAT "BREATHES"! Outside air is drawn in and used air forced out. Heated in cold weather.

Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB, cushioned on rubber against road shocks, torsion and vibration.

Chevrolet's exclusive SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

Uniwide, All-Steel Cab Construction • Large, Durable, Fully-Adjustable Seat • All-Round Visibility with Rear-Corner Windows\* • Heavier Springs • Super-Strength Frames • Full-Floating Hypoid Rear Axles in the 3800 Series and Heavier Duty Models • Double-Articulated Brake Shoe Linkage • Hydrovac Power Brakes in Series 5000 and 6000 Models • Multiple Color Options.

\*Heating and ventilating system and rear-corner windows with defrost equipment optional at extra cost.

**CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!**



Unload a whole trip on the move, at the rate of a ton-a-second! No delays for uncoupling...no stopping to dump with **A.C.F.** Drop Bottom Mine Cars!

The faster mine cars get back to the loaders, the more actual working time those loaders deliver!

**A.C.F.** Drop Bottom Mine Cars save minutes by dumping on the move. A whole 16-car trip of five-ton cars empties in 80 seconds. Lubricated doors unlatch-and-latch automatically. No delays, no breaking up the trip. Minutes earlier, the cars head back down to the mine...minutes earlier, the trip is in place, waiting to be loaded!

You may find **A.C.F.** Drop Bottom Mine Cars as highly profitable in your mine as many other operators have. Our nearby sales representative will gladly work with you on your hauling problems. Call him today.

**A.C.F.** **MINE CARS**  
*for Greater Mining Efficiency*

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*The* CLARKSON

*Redbird*

TYPE 28 FA UNIVERSAL



Conveyor Elevated



Conveyor Head-on



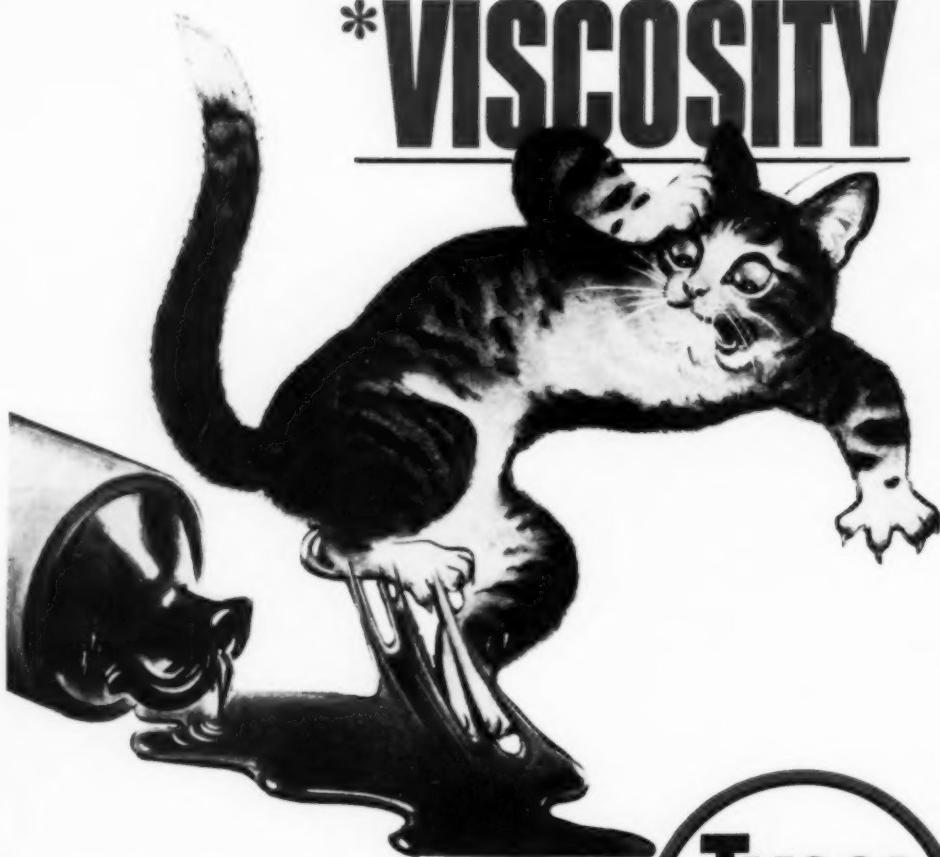
# ON RUBBER

The only completely  
mobile face loader  
on rubber tires

*The* **CLARKSON**  
MANUFACTURING CO.  
*Nashville*  
*Illinois*

Printed in U. S. A.

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All equipment will last longer — give better service — if you use the proper lubricant. That's why you'll find it profitable to use Tycol high quality oils and greases.

There's a reason! No matter what your lubrication need — for roll neck bearings or mine cars, Diesels or high speed textile spindles, turbines, paper calenders or steam engines . . . where \*VISCOSITY, penetration, extreme pressure is a factor — Tycol has a lubricant suited to your specific requirements.

Refined from selected crudes, Tycol lubricants are exceptionally resistant to breakdown which means greater economy . . . longer life for every type of equipment.

Let us show you the extra value in every measure of Tycol lubricants. Write your nearest Tide Water Associated office today.



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"LEARN WHAT THIS PRODUCT CHARACTERISTIC MEANS TO YOU — READ "LUBRICANIA" This informative handbook, "Tide Water Associated Lubricania," gives clear, concise descriptions of the basic tests used to determine important properties of oils and greases. For your free copy, write to Tide Water Associated Oil Company, 17 Battery Place, New York 4, N.Y.

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# JOY

*The Pioneer in  
Mechanized Mining*

**FIRST AGAIN  
WITH THE  
CONTINUOUS  
MINER**

**(TWO MODELS: HIGH AND LOW COAL)**

**Write for Bulletin, or Consult a Joy Engineer**

W&D CL2514



**JOY MANUFACTURING COMPANY**

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**THE LAST WORD IN**

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*Consult a  
Joy  
Engineer*



**PERMISSIBLE  
EQUIPMENT**



**ROOF-BOLTING TEAM!**

# **JOY** MINE-AIR COMPRESSORS and STOPERS

*Check these Advantages!*

★ JOY COMPRESSORS ... B of M-approved, and less than 30" high. Rubber tire and track models, either self-propelled or draw-bar types. Two sizes: 130 or 175 CFM at 115 PSI. Compressors are two-stage, single acting, air-cooled—highly efficient and reliable.

★ JOY STOPERS ... Complete line down to 21" high for roof-bolting applications. These stopers do the entire job: drill the hole, drive the bolt and wedge—and as an exclusive feature, have a built-in torque wrench for tightening the nut.

50 YEARS of COMPRESSOR and DRILL-BUILDING EXPERIENCE



*Consult a Joy Engineer*

WAD CO. 2561

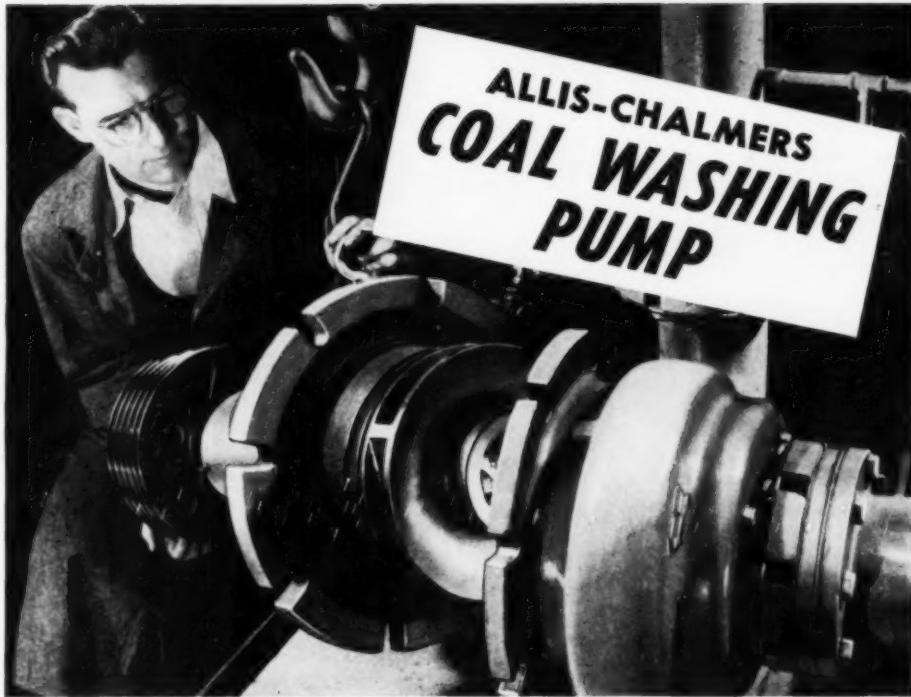


# **JOY MANUFACTURING COMPANY**

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

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# Only 1/2 Hour to Service!



ALL COAL WASHING PUMPS require periodic replacement of worn parts. This "CW" (coal washing) pump saves you money because parts replacement is easy, fast and economical. The entire pump can be dismantled and reassembled in a half hour without disturbing piping.

Parts with varying rates of wear are separated. Only worn parts need be replaced. Three sets of bearings, brackets and shafts cover entire range of pump sizes . . . reducing parts inventories as much as 2/3!

#### USERS REPORT LONG WEAR

Experiences of coal operators prove that the combination of *Allisite*, an abrasion-resistant alloy, heavier construction and expert application engineering give the "CW" pump longer wear between servicings. Users say:

"Inspection and lubrication have been only expenses on our A-C coal washing pump in 10 months of operation."

"After 13 months operation, two and three shifts, we have just replaced impeller on A-C coal washing pump."

*Allisite* is an Allis-Chalmers trademark.

"A-C coal washing pump still delivers full flow after pumping slurry with 50% solids for 8 months." An A-C representative will be glad to give you additional facts and figures on possible savings for you. Or write for Bulletin 6381.

A-2765

ALLIS-CHALMERS, 968A SO. 70 ST.  
MILWAUKEE, WIS.



#### ONLY FIVE WEARING PARTS

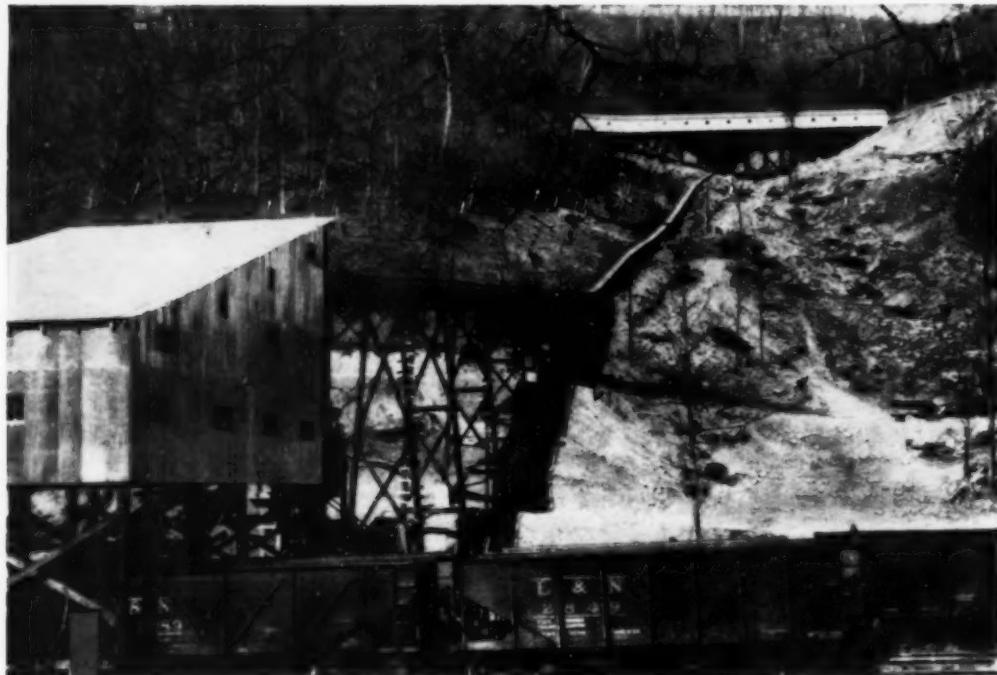
Shaft sleeve, impeller, casing, two wear plates. All easy to handle and easy to replace.



# ALLIS-CHALMERS

# *This unified coal-handling*

Hewitt-Robins "continuous flow" coal-handling system helps the Fourseam Coal Corporation keep pace with high-speed production



No coal-handling bottlenecks here!

The speed and modern efficiency of this "continuous flow" preparation plant makes routine of high production schedules.

It's the completely unified coal-handling system engineered by Hewitt-Robins for the Fourseam Coal Corporation at its Pine Mountain Mine, Leatherwood, Ky.

Coal is guided by a Robins Reciprocating Feeder to a 900-foot Hewitt-Robins De-

clined Belt Conveyor, equipped with Robins Rubberdisc Cushion Idlers at the loading point. The coal then moves down the mountain to the tipple at a speed of 450 feet per minute. And finally, it is guided through a double-deck Gyrex Screen for sizing before being loaded into waiting railroad cars.

This high-speed combination . . . designed, built and installed by Hewitt-Robins . . . has a capacity of 500 tons per hour!

**HEWITT-ROBINS COMPLETE COAL-HANDLING SYSTEMS**

# *system stops bottlenecks!*



## SIMULTANEOUS LOADING

by two picking-table boom conveyors. These conveyors, equipped with Hewitt-Belting, reach to the very bottom of hopper cars. As coal level rises, booms also rise.



## HEWITT-ROBINS DECLINED CONVEYOR

36" wide with 900' centers, leads coal by easy stages through a 142' drop to the tipple. Maximum slope is 17 degrees, minimum slopes 6 degrees.

## PUSH-BUTTON CONTROL

—symbol of modern coal-handling and preparation efficiency—guides coal through each step of processing and loading into waiting railroad hopper cars for shipment.

## Let Hewitt-Robins help you prevent coal-handling bottlenecks!

Whether you plan to modernize your mine completely or simply need to speed up a single operation, Hewitt-Robins stands ready to help you solve your coal-handling problems.

Remember, Hewitt-Robins is prepared to design, manufacture and install every element of your coal-handling system.

For underground mechanization, Hewitt-Robins offers you three standard types of Mine Conveyors—including machinery and belting—now

carried in stock in 26", 30", and 36" widths. So you can take immediate delivery from Charleston, West Virginia, or Passaic, New Jersey.

Whatever your need—idlers, screens, conveyor belts, conveyors, dewaterizers, or a complete coal-handling system—depend on Hewitt-Robins to help you speed your coal to market.

## THESE DIVISIONS OF HEWITT-ROBINS SERVE THE COAL INDUSTRY:

### HEWITT RUBBER DIVISION

Through the manufacture of water hose, air hose, water suction hose, fire hose, and coal conveyor belting.

### ROBINS CONVEYORS DIVISION

Through the manufacture of conveyors, idlers, vibrating screens, cloth, dewaterizers, and two types of car shakeouts.

### ROBINS ENGINEERS

By designing, furnishing and installing complete coal-handling systems including conveying and processing.

**HEWITT  
ROBINS  
INCORPORATED**

RUBBER DIVISION, BUFFALO 5, NEW YORK

CONVEYORS DIVISION, PASSAIC, NEW JERSEY

ENGINEERS, NEW YORK CITY 7, NEW YORK





4

STAR FEATURES  
OF *Whitney*  
UNIVERSAL  
MINING CHAIN

THAT KEEP TONNAGE UP . . .  
MAINTENANCE DOWN



**Link Parts** — plates, pins, bushings and rolls — are precision made from heat-treated alloy steel stock assuring long operating life with minimum maintenance.



**Universal Joints** are constructed of steel forgings for toughness and workability. They are accurately machined for long life.



**Flight Studs** of alloy steel are fully machined and have milled threads. They are heat-treated for extreme toughness and durability.



**End Pins** of the universal joints are fully riveted into deep countersink in the forgings, providing maximum anchorage under all operating conditions.

Get the tonnage producing, cost-cutting advantages of WHITNEY UNIVERSAL MINING CHAIN . . . specify and use this outstanding chain in your loaders. Investigate, too, Whitney Power Transmission Chain, Conveyor Chain and Cut Tooth Sprockets. Write for catalog and information.

**Whitney** CHAIN & MFG. CO.

Division of Whitney-Hanson Industries Inc.  
210 HAMILTON STREET, HARTFORD 2, CONNECTICUT



*...permits*

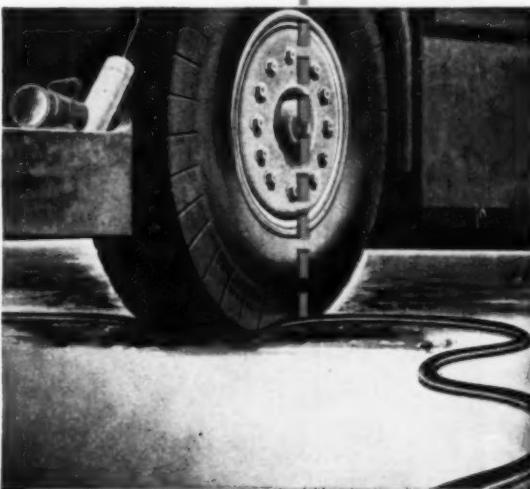
## **HEAVIER IMPACT**

● Because of its patented Anti-Short Breaker Strip (available with or without ground wire) between conductors, Securityflex Parallel Mine Cable can withstand severe impacts with minimum danger of shorting. Adhesion between jacket and insulation—that makes a solid block around conductors—helps to give Securityflex its amazing crush-resistance. (Points that mean greater safety and more tons per cable.)

Other points of interest in Securityflex . . . neoprene jacket protects against flame, abrasion and tearing . . . engineered construction prevents kinking or twisting and stands up longer under extreme overloads . . . cable meets U. S. Bureau of Mines Flame Test and diameter specifications and Pennsylvania Flame Test.\*

Specify Securityflex through your Anaconda distributor (all principal cities). Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

\*Insist on mark of full compliance—P-102-BM—at 12° intervals on any mine cable you buy.



**ANACONDA**

*Securityflex*

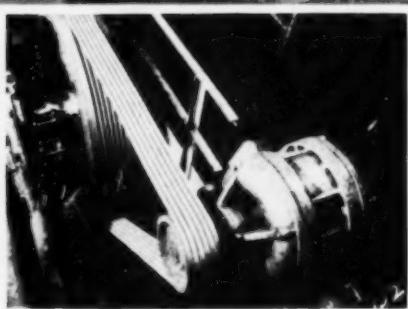
**MINE CABLE**

**ANACONDA**  
from the makers of copper  
and aluminum wire

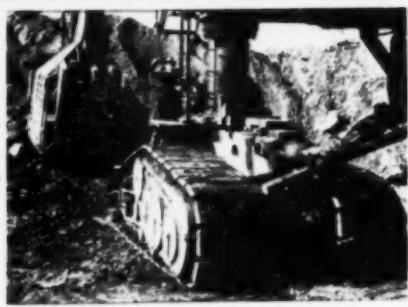
# Sure, 3-Way Engineered



**FOR SPLICING WIRES AND CABLES**—U. S. Tape has high dielectric strength plus long-life rubber compounds.



**U. S. V-BELT DRIVES**—Plenty of pull in U. S. multiple belts with Equa-Tensil Cord Section. They resist stretch, absorb shock. They're safe. When designing new drives, use the U. S. V-Belt Engineering Catalog.



**U. S. PACKINGS**—Hydraulic Ram in this tremendous shovel is packed with U. S. Matchless—the self-adjusting packing with automatic action. Reduces wear, reduces time out for replacement.

U. S. Way Splicing is the standard method of operation in the coal industry. It's used in the O-

# Conveyor Belts Help Cut Mining Costs...

BUT V-BELTS—PACKINGS—HOSE  
AND SPLICING TAPE  
*are important, too!*



**U. S. CONVEYOR BELT**—This U. S. Rubber slope conveyor belt is part of the system that cut one mine's haulage cost 50¢ per ton with 25% lower investment. Underground belts cut costs, too. Hundreds of thousands of feet of U. S. Rubber belts are hauling coal economically underground and on the surface.



**U. S. SUCTION AND DISCHARGE HOSE**—Both are specially built for the toughest mining service. They'll take all the abrasive action you give them and then some. Try them.

Whatever your mining needs, call in a U. S. Rubber Engineer to get lower costs, higher efficiency. Mechanical Goods Division, United States Rubber Company, Division of the American Cyanamid Company.

**U. S. RUBBER**  
SERVING THROUGH SCIENCE

$$L_1 + \Pi_2 + \dots + \Pi_k$$

$$\frac{12}{2} = 5$$

$$W = \int_0^s mads$$

$$H = \text{Total units of work} \cdot f(EI)$$

$$\sum_{k=1}^{k=\text{last}} \sum_{k=1}^{k=\text{last}} W_k$$

$$f = ma$$

$$\text{Work } k^{\text{th}} \text{ haul} = W_k$$

$$\text{Cost} = \frac{C_1 + C_2 + C_3}{\sum W}$$

$$I + M + ?$$

$$dW = F ds$$

$$W = \{ \Pi_1 + \Pi_2 + \dots + \Pi_k \}$$

$$f = \frac{w}{g} a$$

$$y = \frac{H}{W} + \cosh \frac{wx}{H} + B$$

$$5 \text{ Tons/day} \times 400 \text{ days}$$

$$C_T = C_1 + C_2 + C_3 + C_4$$

$$433 \text{ days} @ 325 \text{ tons/day} \quad W_v = \frac{F_o^2}{k} \cdot \frac{\omega}{1 - (\frac{\omega}{\omega_0})^2} \int_0^T \sin \omega$$

$$y = \frac{H}{W} + \cosh \frac{wx}{H}$$

$$A \times 6 =$$

$$\frac{C}{W} = \frac{C_1}{F_o}$$

$$= \sum_{k=1}^{\infty} C_k$$

$$\frac{F_o^2}{k}$$

$$W =$$

$$ds =$$

#### BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

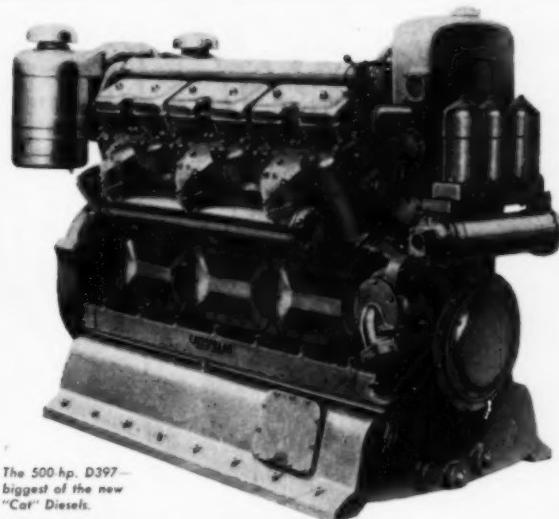
On the Pacific Coast Bethlehem products are sold by  
Bethlehem Pacific Coast Steel Corporation  
Export Distributor: Bethlehem Steel Export Corporation



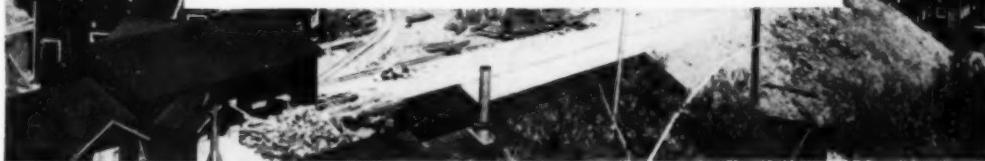
$$\frac{5236.83}{2.65} = 1976.$$

$$\text{unit cost} = \frac{C_1 + C_2 + C_3}{\sum W}$$

# New BIG YELLOW ENGINES BUILT TO HANDLE BIG JOBS



The 500-hp. D397—  
biggest of the new  
"Cat" Diesels.



MINING MEN the world over have learned from long experience that they can always depend on "those big yellow 'Caterpillar' Diesel Engines." They've proved themselves in shovels, dredges, draglines, compressors, hoisting machinery, and as Electric Sets.

Now you can power even bigger equipment—with new, bigger "Cat" Diesels. In addition to present models, four great new Engines, ranging up to 500 hp., and four new Electric Sets, generating up to 314 kw., are now coming out of the world's finest, most modern engine

factory. Every one is designed to burn low-cost, non-premium fuels—assuring substantial savings. Every one is given a closely supervised dynamometer run to assure proper break-in and full horsepower output.

When you buy new equipment, specify "Caterpillar" Diesels for power. And when you consider replacing the power in your present equipment, call on your reliable "Caterpillar" dealer. For immediate information, SEND IN THE COUPON.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

**CATERPILLAR**  
REG. U. S. PAT. OFF.  
**DIESEL**  
ENGINES • TRACTORS  
MOTOR GRADERS  
EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO.

Box CA-9, Peoria, Illinois

Send me specifications on the new "Cat" Diesel Engines and Electric Sets.

Name \_\_\_\_\_

Address \_\_\_\_\_

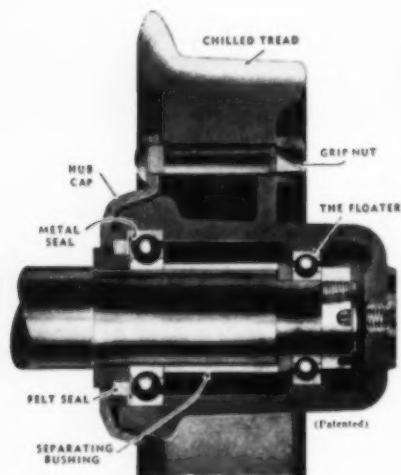
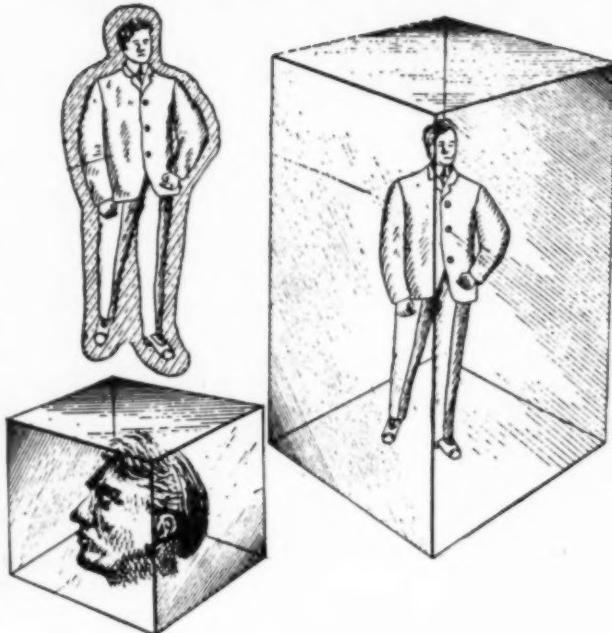
# Mammy Seals Pappy In Glass . . .

**FAMOUS U. S.  
ISSUED PATENTS  
NO. 11 OF A SERIES  
METHODS OF PRESERVING  
THE DEAD**

No. 748,284

Oct. 13, 1903

"... This invention relates to certain new and useful improvements in methods of preserving the dead; and it has for its object the provision of a means whereby a corpse may be hermetically incased within a block of transparent glass, whereby being effectually excluded from the air the corpse will be maintained for an indefinite period in a perfect and life-like condition, so that it will be prevented from decay and will at all times present a life-like appearance."



## S-D "FLOATER" CLOSED HUB WHEELS SEAL GREASE IN!

High costs never die natural deaths! You kill them with improved equipment. The only way you can get rid of big mine car lubrication expense is to install S-D "Floater" Closed Hub wheels on your cars. "Floater" seal the grease in—seal foreign matter out! More and more operators are ordering S-D "Floater" for their mine cars because if they have to grease "Floater" more than once in 5 years, we pay the extra costs . . . because locomotives can haul up to 50 percent greater load with Ball Bearing "Floater" as compared with wheels having other types of precision bearings . . . because "Floater" are demountable like automobile wheels . . . because "Floater" speed up haulage approximately 10 percent . . . and because both castings and ball bearings are guaranteed against undue wear or failure for 5 years. If you are not using S-D "Floater" Ball Bearing wheels, you probably, unknowingly, have a big profit leak in your wheels.

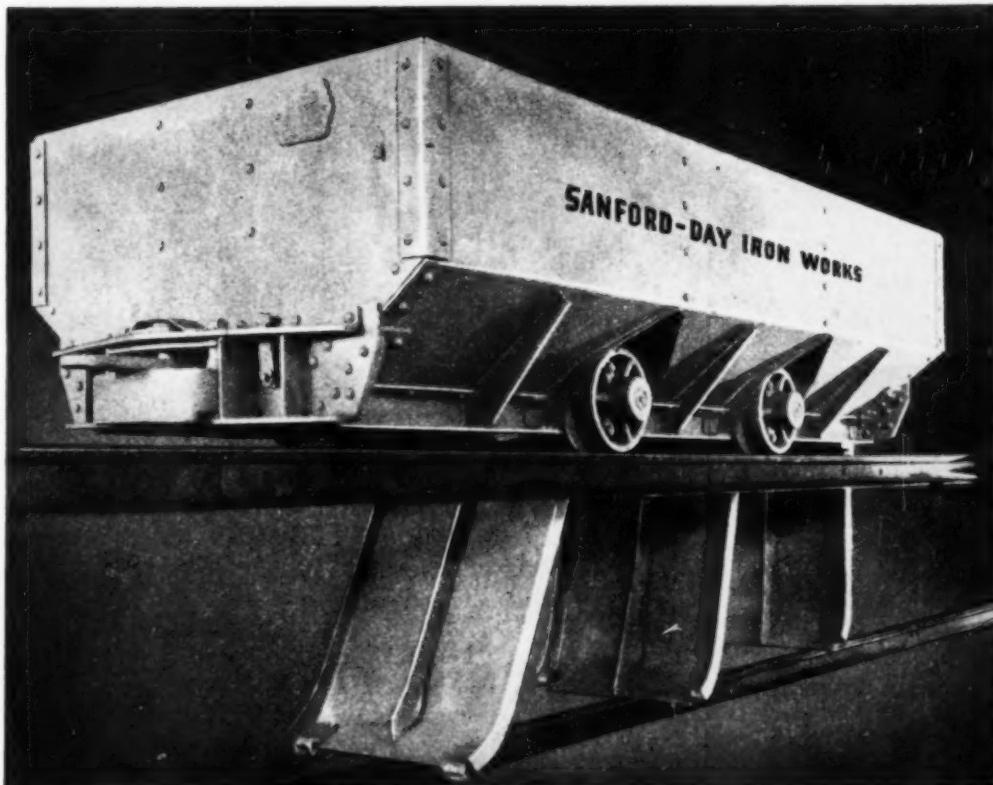
20 Car loads of "Automatics" from -

**SANFORD-DAY IRON WORKS, Inc. • Knoxville 9, Tenn.**

# We Seal Coal Dust In S-D "Automatics"

We don't know whether this "Preserving the Dead" invention has been a commercial success or failure—but we do know that our new revolutionary "COMPLETELY SEALED" patented feature, now being built into every S-D "Automatic" drop bottom mine car, is preserving dollars for profits . . . and has made the S-D "Automatic" the Safety-Sealed car. The new S-D "Sealed Automatic" is dust sealed both at wheel hoods and at the necessary clearance spaces between the doors and the frame. Coal Dust can't dribble out and accumulate on the tracks . . . it stays in the car until it is dumped in the bin.

This patented Sanford-Day feature is another step in maintaining Sanford-Day leadership in saving money for mine operators. You still get the same big capacity and automatic unloading. You get our improved long-life construction and our fool-proof "JerkOut" unlatching device. With this improvement, why "hand out" dollars for preserving coal that leaks through the bottom of ordinary mine cars onto tracks? Why not preserve for profits and extra dividends, the dollars you now spend on track clean-up with conventional cars by installing the new S-D "Sealed Automatics" in your mine!



20 Car loads of "Automatics" from—

**SANFORD-DAY IRON WORKS, Inc. Knoxville 9, Tenn.**

THE TIGER BRAND SPECIALIST SAYS—

**"It's not use but abuse"**



# that determines wire rope life"

## check your application

"Everything was wrong on this job. When I arrived the superintendent and the operator were having a terrific argument. The 'Super' claimed that the operator was wearing out wire rope twice as fast as anybody else on the job. The operator blamed the machine. I could see that nobody knew the real source of trouble.

"I offered to give them a complete check-up and they both jumped at the chance. It turned out that they were using cast iron sheaves which were too soft. To make it worse, the wire rope was not preformed and tended to twist and squirm as it passed over the sheaves.

"The rope bit into the sheaves and the sheaves got rough and chewed up the rope.

"That's the story. I recommended harder manganese steel sheaves and Excellay Preformed Wire Rope. With the right rope for the job, they ought to get twice the service."

### How proper wire rope application saves you money

There is always one best type of wire rope for every application and the TIGER BRAND Wire Rope Specialist can help you select the right ropes for your particular needs. His job is to make sure that the rope is not overloaded. He checks the sheaves for proper size, wear and alignment. He instructs your operators on proper rope care and does a dozen other things to assure long service life at low unit cost for wire rope.

To help you maintain these operating standards, we have prepared a booklet entitled, "Valuable Facts about the use and care of Wire Rope." Every key man on your operating staff should be supplied with this much needed information.

#### SEND FOR FREE BOOKLET



American Steel & Wire Company  
Rockefeller Building, Dept. J-9  
Cleveland 13, Ohio

Gentlemen:

Please send me a copy of your booklet, "Valuable Facts about the use and care of Wire Rope."

Name.....

Company.....

Position.....

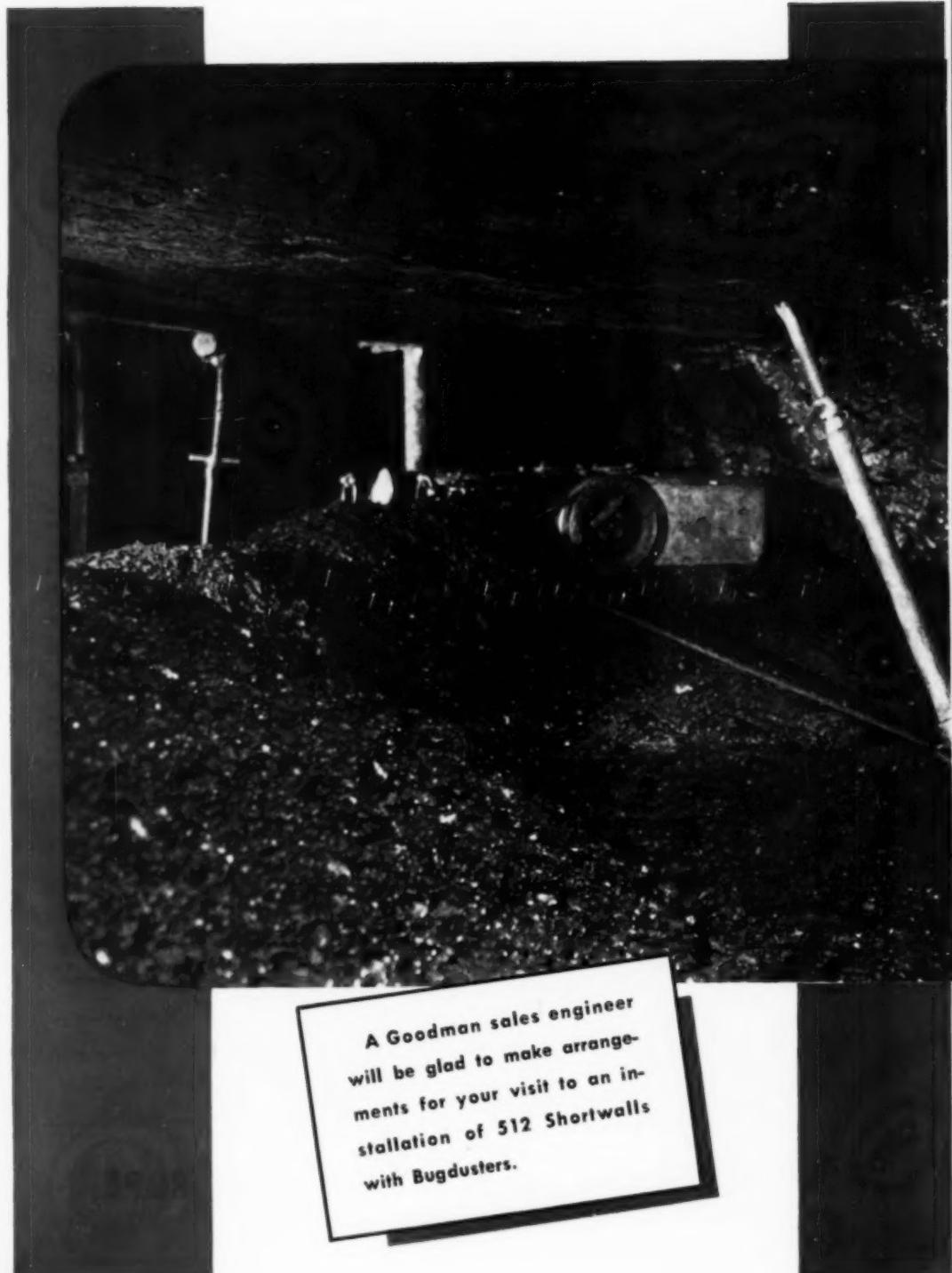
Address.....

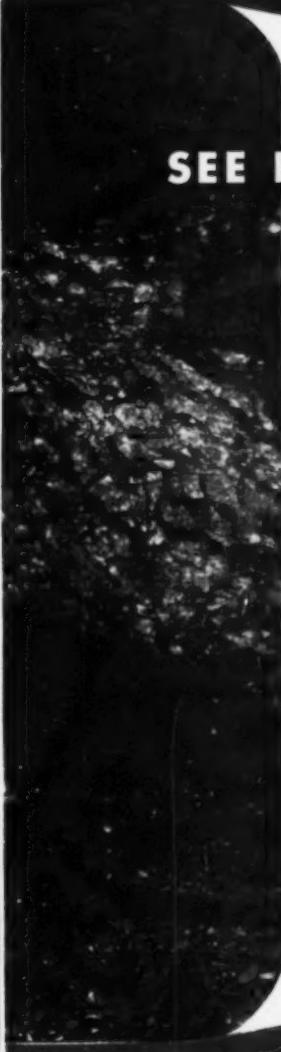


## AMERICAN TIGER BRAND WIRE ROPE

*Excellay Preformed*

UNITED STATES STEEL





**SEE FOR YOURSELF**

HOW THE  
**GOODMAN**  
**TYPE 512 SHORTWALL**  
WITH  
**Bugduster**  
(Patented)

- automatically collects and piles cuttings ready for loading.
- eliminates hand shoveling.
- leaves a clean kerf.
- reduces a dust hazard.
- permits the use of long cutter bars and a free running chain.
- produces coarse cuttings with a decrease in power requirements.

HALSTED ST. AT 48TH **GOODMAN**  
MANUFACTURING COMPANY CHICAGO 9, ILLINOIS

an English Distributor: The Birmingham Engineering Company, Ltd.



**Greater Safety . . .  
More Clearance**

## with *BETHLEHEM* Mine Roof Suspension Supports

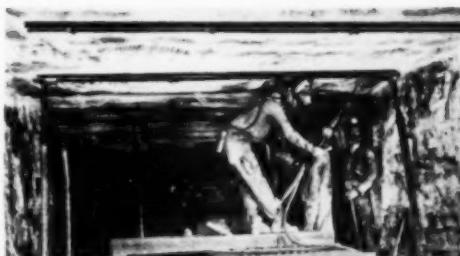
Now it's possible for mines in many cases to do away with space-eating columns and overhead timbers where doubtful roof conditions exist. By means of Bethlehem suspension supports, roof strata can often be "tied" together to form a thick beam which carries the burden overhead.

We suggest you study the drawing. It's a typical installation plan based on the use of steel channels and threaded rods. The upper end of each rod is slotted to accommodate a wedge. After a hole has been drilled in the roof at the designated point, the rod with wedge in place is driven in; then, as the end of the hole is reached, the wedge is forced deeper into the end of the rod, spreading it and causing a very tight fit against the sides of the hole. At the lower end, when the hole is at 45 deg, the channel is held by an angle washer and nut; otherwise, by a plate washer and nut.

Bethlehem also furnishes other sets of suspension supports in which Bethlehem Nos. 5, 6 and 9 tie sections are substituted for channels. This style has great advantages because of the higher beam strength per pound of steel.

Available, too, are simple sets consisting of slotted rod, wedge, plate, and nut. If desired, a machine bolt with expansion sleeve can be used instead of the slotted rod and wedge.

Ask a Bethlehem man for full details. He'll be glad to tell you the whole story at your convenience.



Installing channels. A stoper is used to drill holes and drive the rods.  
(Photo courtesy U. S. Bureau of Mines)

**BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.**

On the Pacific Coast Bethlehem products are sold by  
Bethlehem Pacific Coast Steel Corporation  
*Export Distributor:* Bethlehem Steel Export Corporation



**Money-Saving Planetary Gearing  
is Available only on**

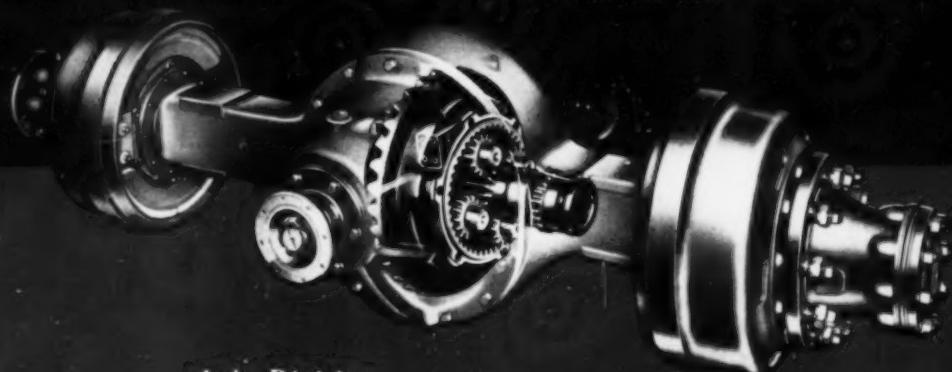
**EATON**

*2-Speed Truck*

**AXLES**

*More Than a Million  
Eaton 2-Speed Axles  
in Trucks Today*

Eaton's exclusive planetary gearing distributes gear-tooth load, reduces stress and wear on gears and bearings, adds thousands of miles to axle life, holds maintenance costs to a minimum. Slower planetary gear movement makes for easy shifting and silent operation. Available for most trucks of the 1 1/2-ton class and larger, Eaton 2-Speed Axles give extra pulling power combined with high speed; save time, fuel, oil, and engine wear. They more than pay for themselves. Ask for a road demonstration . . . see the Eaton advantages for yourself.



*Axle Division*  
**EATON MANUFACTURING COMPANY**  
CLEVELAND, OHIO



PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS • SPRINGITITES SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS



## Here's One High Cost that's "Asking For" DRASTIC ACTION on Your Part!

WHEN critically examining your costs of doing business and seeking more profitable operation, remember that NO ONE HAS A VESTED INTEREST IN HIGH EYE ACCIDENT COSTS! These costs can be cut *drastically* now. 98% of all industrial eye injuries can be prevented when shop workers wear safety goggles, according to the Society for the Prevention of Blind-

ness. Individual case histories show that American Optical Company eye protection programs have saved sums like these: (1) \$16,607 in eight years (2) \$14,000 in two years (3) \$14,200 annually.

Your nearest MSA Representative will be glad to explain the AO program, which may produce similar savings for you.

Ask him for complete details.



American  Optical  
SAFETY PRODUCTS DIVISION

Southbridge, Massachusetts • Branches in Principal Cities

Mine protection starts down deep

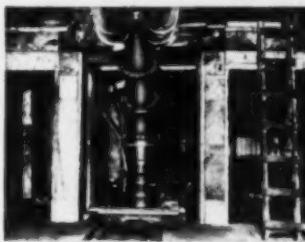
# a BJ submersible

cannot  
be damaged  
by flooding

## Here are 4 important BJ Submersible advantages:

1. Close-coupled motor pump unit operates completely submerged.
2. No danger from flooding or cascading water.
3. No heavy, bulky equipment to handle, install, or maintain.
4. Can be installed where shaft-type deepwell or horizontal pumps are impracticable.

MORE AND MORE OPERATORS are installing Submersibles as the best pumping insurance against flood damage. The Submersible operates completely submerged in water because of the BJ close-coupled motor-pump design. Controls are out of reach of flood waters. There are no long line shafts with innumerable bearings to install and maintain. These are replaced by the marine power cable.



THE COMPLETE PUMPING UNIT can be hung in the shaft, submerged in a collection sump, or placed at the best water pick-up point. Discharge can be to surface, to other mine levels, or to abandoned workings. The Submersible replaces other more complicated horizontal and standby booster pump stations. A single pump can lift up to 1500 feet or handle capacities up to 5000 gpm. Greater lifts and capacities can be provided by combining two or more Submersibles in the same mine shaft or on a single discharge line. Write us today for further details.

1. Pump and motor can be set at any desired depth from 50 to 1500 feet. Can be installed in a corner of the shaft. Requires very little space.

2. Pumping element is directly connected to motor. Number of stages governed by lift required.

3. Submersible motor, completely enclosed, has marine cable to surface. Available in sizes from 10 hp to 400 hp.

**Byron Jackson Co.**

Established 1872

LOS ANGELES 54, CALIFORNIA

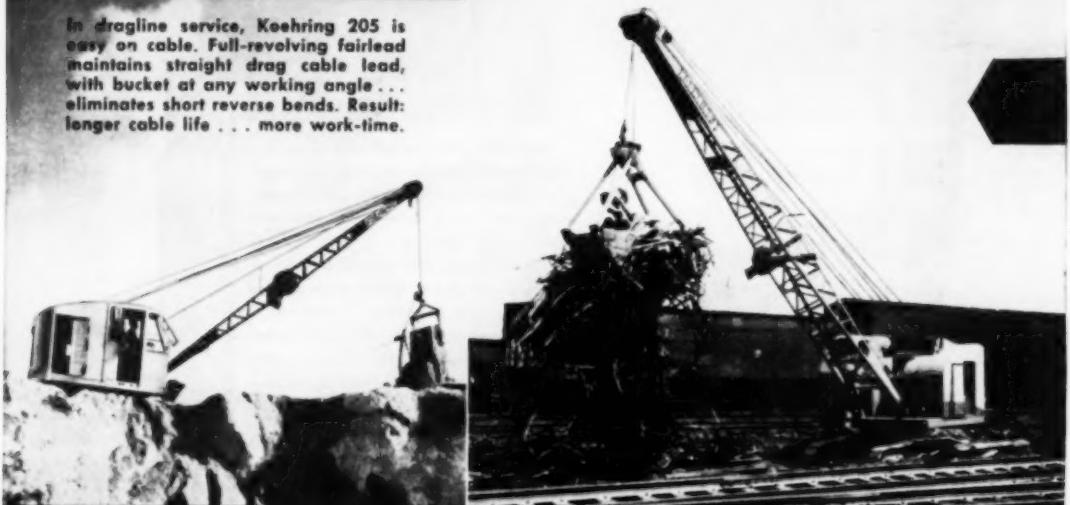
Offices in Principal Cities

Check KOEHRING 205 for top . . .



Full-revolving fairlead  
KEEPS CABLE COSTS LOW

In dragline service, Koehring 205 is easy on cable. Full-revolving fairlead maintains straight drag cable lead, with bucket at any working angle . . . eliminates short reverse bends. Result: longer cable life . . . more work-time.



**KOEHRING COMPANY**

MILWAUKEE 10, WIS.

Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

# **1/2 yard**

## **Independent traction Increases OUTPUT UP TO 50%**

With Koehring heavy-duty  $\frac{1}{2}$ -yard excavator, you get 2-speed traction that is independent of all other operations. Separate lever controls each crawler. 205 travels, swings, hoists, raises or lowers boom all at the same time. Whenever you move frequently, or change boom angles to change reach, this quick maneuverability steps up production as much as 50%.

## **Dual-purpose boom CUTS SHOVEL-PULL SHOVEL COSTS 25%**

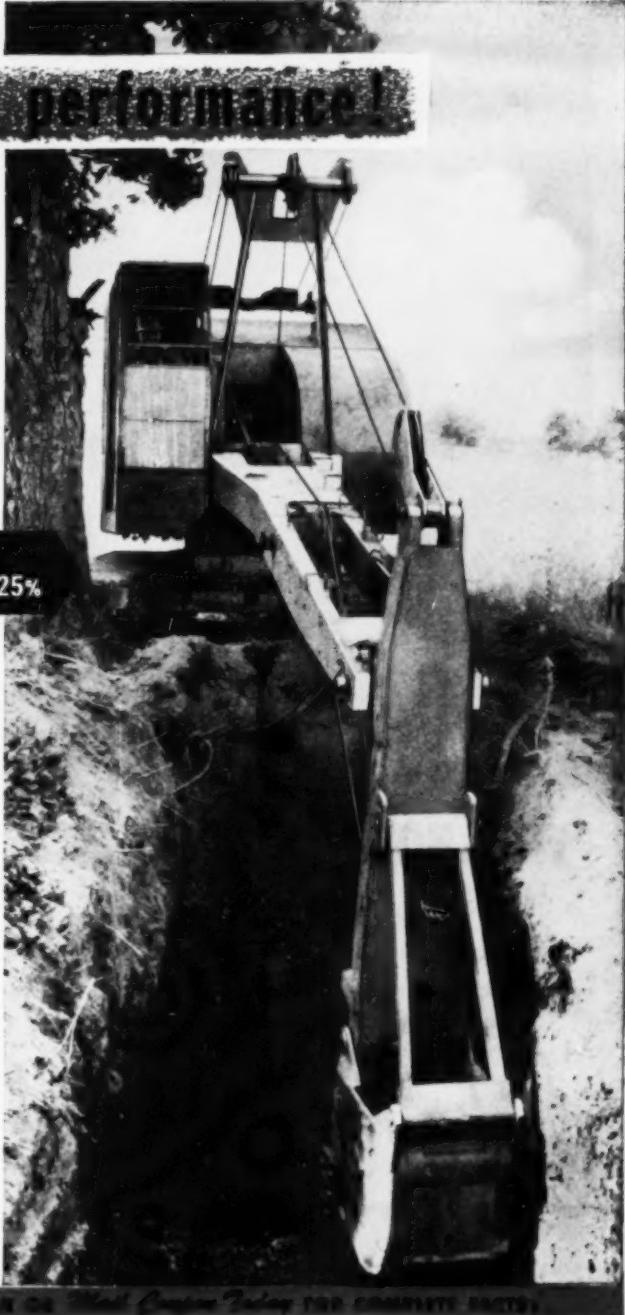
Rigid, heavy-duty 205 boom handles either  $\frac{1}{2}$ -yard shovel or pull-shovel dipper. No need to change booms for either attachment. This Koehring feature costs 20 to 25% less than conventional units that require two separate booms. Crowd and retract cable is self-contained in boom. This saves more time and money every time you convert to dragline or clamshell crane.

## **Self-adjusting clutches ELIMINATE MANUAL SETTINGS**

There's no time-out for continuous manual clutch adjustments . . . no "compromise" settings. Heat compensator springs on the 205's main drum, swing and traction clutches make all tension changes automatically . . . maintain full clutch efficiency at all times. Means bigger daily output . . . is particularly important on clamshell work where you have intermittent usage.

There are many more Koehring "plus" values that can increase daily production and lower costs on your work. It will pay you to get all the facts on this crawler or rubber-mounted  $\frac{1}{2}$ -yd. 205. Other Koehring sizes:  $\frac{3}{4}$ -yd. 304,  $1\frac{1}{2}$ -yd. 605, and  $2\frac{1}{2}$ -yd. 1005.

K914r



To: KOEHRING COMPANY, Dept. R, Milwaukee 10, Wisconsin

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_

TITLE \_\_\_\_\_

STATE \_\_\_\_\_

$\frac{1}{2}$  yd.  
205        $\frac{3}{4}$  yd.  
304  
  $1\frac{1}{2}$  yd.  
605        $2\frac{1}{2}$  yd.  
1005



## WHY NOT GET THAT EXTRA LOADING TIME?

What really counts is the total number of hours your loading machine can operate over a period of time. Many delays which occur are beyond control but you can guarantee your loader delays to be at a minimum if you use Whaley "Automats."

THE AUTOMAT'S RUGGED CONSTRUCTION GUARANTEES AN ABSOLUTE MINIMUM OF LOADER BREAK-DOWN DELAYS.

THE AUTOMAT'S SIMPLICITY GUARANTEES A QUICK REPAIR AND EARLY RETURN TO LOADING.

RESULT—MAXIMUM LOADING TIME . . . MAXIMUM CAPACITY.

**Myers  
Whaley**

"Mechanical Loaders Exclusively for Over 40 Years"

KNOXVILLE

TENNESSEE

Trip of Timken bearing equipped A.C.F. drop-bottom cars at the Moss Mine of Clinchfield Coal Corporation. The Jeffrey locomotive shown hauling these cars is also equipped with Timken bearings.



Belt conveyor installation at Clinchfield's Moss Mine. Timken bearing equipped idlers manufactured by Industrial Division, Continental Gin Company, Birmingham, Alabama.

KEEPING THE COAL  
MOVING AT  
*Clinchfield's*  
MOSS MINE

Timken tapered roller bearings figure importantly in coal handling equipment at the Moss Mine of the Clinchfield Coal Corporation, Dante, Va.

They are used on the axles of hundreds of big, modern, all-steel drop-bottom coal cars built by American Car and Foundry Company, in the idlers of the belt conveyor system to the preparation plant manufactured by Industrial Division, Continental Gin Company and in the Jeffrey mine locomotives.

Timken bearings keep things moving quickly, safely and economically wherever they are used because the incredibly smooth finish of their contact surfaces rules out friction; their scientific tapered design enables them to carry all loads — radial, thrust and both combined; the line contact of their rollers and races holds moving parts in constant alignment; the Timken alloy steel of which they are made — the finest material ever developed for tapered roller bearings — gives Timken bearings tremendous strength and resistance to wear, loads and shocks for maximum life and low maintenance.

Make sure you have them in mine cars, locomotives, mining machines, loaders, belt conveyor idlers and equipment of all kinds. Look for the trade-mark "TIMKEN" on every bearing.

**TIMKEN**  
TRADE-MARK REG. U. S. PAT. OFF.  
TAPERED ROLLER BEARINGS



THE TIMKEN ROLLER BEARING COMPANY  
CANTON 6, OHIO  
Cable Address "TIMROSCO"

NOT JUST A BALL • NOT JUST A ROLLER • THE TIMKEN TAPERED ROLLER • BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION





*Formula  
for  
Progress!*

## EQUIPMENT + MANPOWER = PEAK PERFORMANCE

C & O's president, Walter J. Tuohy, in an address in New York a few months ago stated "More bituminous coal originates on the C & O than on any other railroad, approximately 1/3 of the country's production". Behind that statement lies a dramatic story of achievement, achievement on a gigantic scale involving two Titans of industry—railroad and coal. Through every phase of railroad operation—from equipment to personnel C & O has forged a formula that has made it the nation's outstanding coal serving railroad. In 1948 C & O spent \$86,000,000 on the expansion and improvement of its coal handling facilities. That amounts to almost a dollar a ton based on the number of tons carried that year. Railroad lines were extended to serve new coal mines . . . new yard and terminal facilities were add-

ed . . . a modern high capacity pier for handling the tidewater coal at Newport News, Virginia is all but completed. Car retarders and major track installations have been made at Toledo . . . signals and miscellaneous facilities involving 386 miles of new Centralized Traffic Control are among the other improvements. In short, C & O completed an all-along-the-line expansion program for coal designed to fulfill every need of the great coal industry. That has been the C & O policy in the past and will continue to be its policy in the future—for just as coal is the backbone of the C & O—the railroads and coal combined comprise the backbone of the nation.



## CHESAPEAKE & OHIO RAILWAY

*Largest Originating Carrier of Bituminous Coal in the World*



JOIN THE TREND TO TOP

# PERFORMANCE



## Preformed "Blue Center" Wire Rope

### A FIRST SPECIFICATION AMONG MINING MEN

WHEN YOU PULL DOWN COSTS these days it's something to brag about. And with Preformed "Blue Center" Wire Rope you can cut costs to the minimum.

"Blue Center" Steel—made only by Roebling—provides shock resisting

stamina and toughness. The Preforming process—improved and perfected—simplifies installation, reduces whipping and vibration, improves winding. It is not inclined to twist and kink . . . is easy to handle and install . . . can be cut without seizing. This combination of

advantages gives unsurpassed life and serviceability.

Roebling Wire Rope is one of the best-known products in industry today. There's a type and size for every kind of service. Have your Roebling Field Man suggest the one rope best adapted to your requirements. John A. Roebling's Sons Company, Trenton 2, New Jersey.

WRITE OR CALL THE ROEBLING FIELD MAN AT YOUR NEAREST  
ROEBLING OFFICE AND WAREHOUSE

Atlanta, 934 Avon Ave. • Boston, 51 Sleeper St. • Chicago, 5525 W. Roosevelt Rd. • Cleveland, 201 St. Clair Ave., N. E. • Denver, 1635 17th St. • Houston, 6216 Navigation Blvd. • Los Angeles, 216 S. Alameda St. • New York, 19 Rector St. • Philadelphia, 12 S. 12th St. • Pittsburgh, 855 W. North Ave. • Portland, Ore., 1032 N. W. 11th Ave. • San Francisco, 1710 17th St. • Seattle, 900 First Ave.

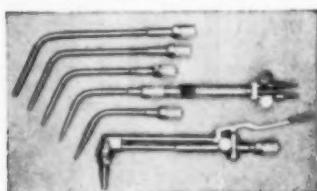
# ROEBLING

★ A CENTURY OF CONFIDENCE ★

# YOUR SUPPLY DEPOT.....

## for oxyacetylene flame and electric arc equipment, supplies and accessories

**NEW AIRCO 700 WELDING TORCH.** The new Airco 700 is suitable for 90% of your welding and brazing work. It is available with tip assemblies ranging from Nos. 00 through 10 . . . with an individual



individual mixer drilled for each particular tip. This means better flame control—there is no sputtering, and better welds result. The new "700" also features:

- ... Wide operating range—can weld everything from thin sheet metal up to two inch plate, and when equipped with multi-flame tip, it's tops for silver and aluminum brazing.
- ... Perfect balance—lightweight, with  $\frac{1}{8}$ " I.D. hose, it eliminates operator fatigue.
- ... Low maintenance cost—its long-wearing monel head means fewer replacements, and reduced maintenance because rarely is reseating required.

With the addition of a cutting attachment, the new "700" can be easily converted to handle general shop cutting work.

FOR HEAVIER JOBS, Airco also has available a new Series 800 Torch which is comparable to the "700" in both appearance and operating characteristics.

These outstanding new welding torches are but two of the many included in Airco's complete line of torches for every conceivable gas welding and cutting application.

**LOW-COST AIRCO No. 10 RADIAGRAPH GAS CUTTING MACHINE.** The No. 10 Radiograph is a motor-driven, portable gas cutting machine that cuts in straight lines of any desired length, at speeds from 4" to 50" per minute. It also cuts arcs up to 42 $\frac{1}{2}$ " radius, circles from 3" to 85" in diameter, and bevels up to 40° angle. It weighs only 41 pounds net, and is easily moved from job to job.

Other types and styles of portable machines are also available, as well as a wide variety of stationary types, which operate on the pantograph principle. These machines include the popular Planigraph, Oxygraph and Travograph, and are designed to cut straight lines, rectangles, circles and irregular shapes from thinnest steel sheet to thicknesses of 12" or more.



**AIRCO TWO - STAGE PRESSURE REGULATORS.** These popular regulators for use with oxygen, acetylene, hydrogen, or nitrogen require but one adjustment . . . the first. Once set at the correct operating pressure, they deliver a constant, non-fluctuating flow of gas from start to finish of cylinder discharge. Drops in cylinder pressure are automatically compensated for, thus enabling the operator to devote his full attention and skill to the job at all times.

Airco single - stage regulations are also available for all gas pressure uses.



**AIRCO GAS WELDING AND CUTTING SUPPLIES.** Airco also produces a complete line of supplies for every phase and stage of gas cutting and welding. Included in the line are: welding rods, fluxes, cylinder trucks, tip cleaning drills, spark-lighters, gloves and goggles.

**NEW WILSON "HORNET 36A" DC WELDER.** The Wilson "Hornet 36A" Arc Welder is the newest member of a famous arc welding machine family. It is a heavy-duty, light-weight machine designed to furnish smooth, steady current for every DC arc welding job—even under severe operating conditions.

The "36A" features simplified control of current output by means of a sturdy hand-wheel mounted on the control cabinet. Close calibration of the current dial eliminates the need for meters. Easy reversal of the polarity of the welding terminals is provided by a sturdy polarity switch. 200, 300 and 400 ampere sizes are available.

Other arc welding machines in the Airco line include the production-proved Wilson "Bumblebee" AC welders, known for their ease of operation and wide power range. These machines feature improved electrical efficiency at rated loads, wide current range, low open circuit voltage (75 volts), vastly improved power factor, quiet operation and minimum maintenance. In fact, there is a Wilson machine for every AC or DC welding purpose.

**AIRCO AC/DC ELECTRODES** (including Stainless Steel and Hardfacing Alloys). Time - tried and production-tested, Airco's vast line of electrodes is engineered to supply the right answer for every welding problem. They range from general-purpose, mild-steel electrodes through the new special electrodes for welding "difficult" metals and alloys, and generally are available in both AC and DC types.

**AIRCO ARC WELDING ACCESSORIES** includes helmets, electrode holders, cable, clamps, gloves, brushes, and other items.

### GASES

**AIRCO OXYGEN, ACETYLENE AND RARE GASES** are known throughout industry for their purity, economy and operating characteristics.

### CARBIDE

**NATIONAL CARBIDE** (in the red drum) is made from the finest available coke and limestone. It is evenly sized and dust-free, and gives a high, uniform yield of acetylene gas.

For more information on the products on this page, as well as those making up Airco's complete line, write your nearest Airco Office, or Authorized Airco Dealer.



# AIR REDUCTION

60 East 42nd Street, New York 17, N. Y.

Offices in principal cities

On West Coast: Air Reduction Pacific Company

In Texas: Magnolia Airco Gas Products Company

# WICKWIRE ROPE

A PRODUCT OF

CF&I

Ask any user...you'll find them everywhere

In scores of industries, users of Wickwire Rope have developed an affectionate respect for its performance, safety and long life. And, for true economy, they use Wickwire's WISSGOLAY® Preformed. It lasts longer — it's easier to cut, splice and install. It's kink-resistant and safer to handle. Wickwire Distributors and Rope Engineers, in key cities everywhere, are prepared to render prompt service in meeting your wire rope needs. Wickwire Rope

Sales Office and Plant — Palmer, Mass.

IN THE EAST—Wickwire-Southern Steel Div. of C. F. M.

500 Park Ave., New York 16, N. Y.

IN THE ROCKIES—The Colorado Fuel and Iron Corp.

Continental Oil Bldg., Denver, Colo.

ON THE WEST COAST—The California Wire Cloth Co.

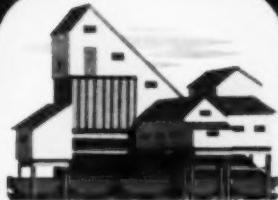
1060—19th Ave., Oakland 4, Calif.



LOGGING



TRANSPORTATION



MINING



PETROLEUM



MANUFACTURING



MARINE



CONSTRUCTION

## COAL MINERS

# BUY DODGE - save money

### SAVE . . . with these many money-saving features

**ENGINES** . . . of famous Dodge L-head design save gas, oil, service expense. Full-pressure lubrication, full-length cylinder cooling, and replaceable prefitted main bearings reduce upkeep, prolong life.



**CHASSIS** . . . Super-friction clutches, with extra large frictional area; rugged 3-, 4- and 5-speed transmissions; full-floating, hypoid rear axles give better performance, insure longer life. Cross-type steering permits sharper turning, easier handling. Cyclebonded brake linings (no rivets) insure safer stops, prolong lining wear.



**CABS** . . . Adjustable "Air-O-Ride" seats. Roomy, wide-vision "Pilot-House" cabs, with rear quarter windows, extra-wide seats and "All-Weather" ventilation, insure maximum vision, comfort and safety.



You save money when you buy Dodge "Job-Rated" trucks!

There are two reasons for this:

1. Your truck has more money-saving features than any other make of truck built. Many of these are *exclusive* Dodge features.
2. Your "Job-Rated" truck is built to fit its job. And trucks that fit the job save on operating costs. They last longer!

Read (at left) a partial list of Dodge truck features that are important to you. Then—see your Dodge dealer for all the reasons why a Dodge "Job-Rated" truck (priced with the lowest) is the best truck investment you can make.



For the good of your business—

Switch to **DODGE**  
"Job-Rated" **TRUCKS**

# Rome 60

## MINING CABLES

(NEOPRENE SHEATHED... MOLDED IN LEAD)



# GROUNDED and FLAME PROTECTED

For Safety

**PLUS**

RESISTANCE TO ACIDULOUS MINE WATERS  
RESISTANCE TO ABRASION  
UNIFORM DIAMETERS  
SUPERIOR QUALITY

Look for "Appro. P-105  
BM" Molded in the Neoprene  
sheath—it is your assurance  
of compliance with Federal and  
State of Penn. Safety Codes.

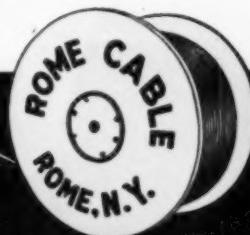
### THE ROME 60 LINE INCLUDES:

- Type SO Portable Cords
- Single Conductor Locomotive Cable
- Concentric (Two Conductor) Cable
- Parallel Duplex (Twin) Cable  
With or Without Ground Wire
- Multi-Conductor Power Cable—  
Types W and G.

WRITE TODAY FOR  
DESCRIPTIVE FOLDER  
GIVING CONSTRUCTION  
DETAILS, DIAMETERS,  
AND WEIGHTS

FROM BAR TO FINISHED WIRE

**ROME CABLE**  
CORPORATION  
ROME • NEW YORK



# 3 PROVED WAYS TO CUT

WITH NON-EXPLOSIVE

## CARDOX



1

Savings begin right at the mine face when the gentle, heaving action of expanding carbon dioxide replaces explosives. CARDOX mined coal is coarser and is rolled forward for quicker, easier loading. Complete absence of smoke and noxious fumes enables resumption of work without time loss immediately after shooting. Because there is less shattering, coal cleaning costs are lower; roof control costs are sharply reduced. Finally, CARDOX produces more premium size coal per ton due to reduction in costly degradation at the face, in shipping and storage.

## AIRDOX



2

AIRDOX "shoots" coal with compressed air. Its "soft" action in breaking down the face produces a high percentage of coarse sizes free from shatter cracks . . . shears rib and top cleanly . . . rolls the coal forward in a loose pile for quick loading . . . reduces roof failure danger. Crews can enter immediately after the fall. Recommendations as to whether CARDOX or AIRDOX is the more efficient and economical for any particular mine will be made after examination by one of our engineers.

### GET THE FULL SAVINGS STORY

Write today for complete information on CARDOX, AIRDOX and CARDOX-HARDSCOG equipment as applied to your operations.

# MINING COSTS

## MINING METHODS

### COAL RECOVERY DRILL



3

The Cardox-Hardsocg "Coal Recovery Drill" makes profitable the salvage of tonnage where overburden removal has become too costly for further stripping. The specially designed augers, available in diameters of 20" to 30", carry the coal in a continuous flow from the seam—can be used with portable conveyors for automatically loading trucks or cars.

### CARDOX-HARDSOCG Carbide Tipped Cutterheads



Tipped with carbide that approaches diamond-hardness, these Cardox-Hardsocg Cutterheads reduce drilling costs four ways: (1) They multiply footage between cutterhead changes; (2) their drilling capacity in hard material far exceeds that of molefoot drills; (3) they step up drilling rates under most conditions; (4) they have longer life in the heaviest service. Available in 2, 2 1/4, 2 1/2, and 3-inch sizes with two wings; in 5, 6, 6 1/2 and 7-inch sizes with three wings; 8 and 9-inch sizes with four wings. May be had with recessed core breaker as shown or extended pilot and with spline, square or hexagon connection.

**CARDOX CORPORATION**

BELL RIVER DIVISION — CHICAGO 1, ILLINOIS

**WE CAN INCREASE YOUR YARDAGE  
50 TO 100%**

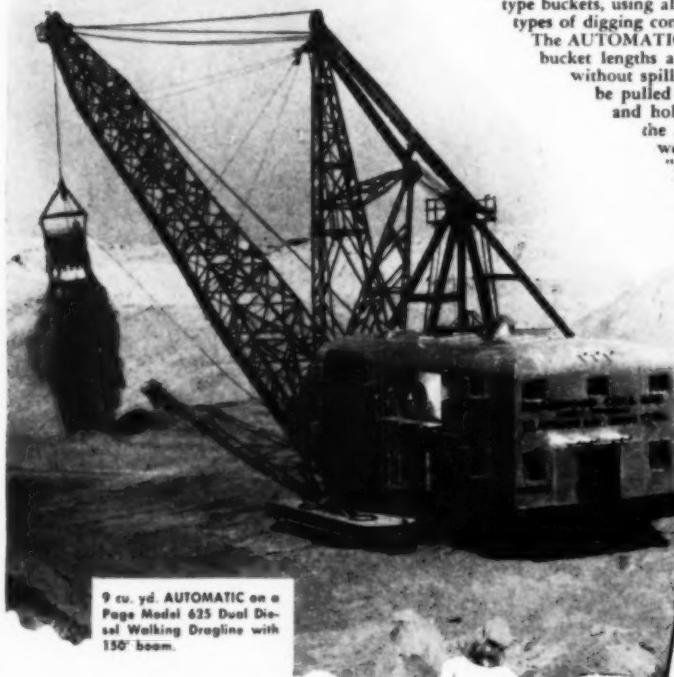
*It's a Guarantee*



Type of Bucket	Load Time	Dump Time	Jockeying Time	Total Time	Full Loads Each Trip
<b>AUTOMATIC</b>	3 to 7 sec.	2 to 4 sec.	8 sec.	8 to 11 sec.	100%
Ordinary Type	7 to 16 sec.	4 to 7 sec.	2 to 6 sec.	13 to 29 sec.	85%

THESE are the facts proven by numerous tests made recently between the Page AUTOMATIC and ordinary type buckets, using all sizes from  $\frac{1}{8}$  to 30 cu. yd. in various types of digging conditions.

The AUTOMATIC always gets a full load within 1 to 2 bucket lengths and can be picked up immediately without spilling while ordinary buckets have to be pulled at least 4 to 6 bucket lengths to get and hold their loads. Another point about the AUTOMATIC—it is always the correct weight for maximum digging efficiency. "Light-weight" buckets of larger "rated" capacity cannot match the profit-making ability of a Page. For more yardage per day, lower power costs and minimum maintenance, be sure your next dragline bucket is a Page AUTOMATIC.



9 cu. yd. AUTOMATIC on a Page Model 625 Dual Diesel Walking Dragline with 150' boom.

**PAGE** *Automatic*  
DRAGLINE BUCKETS and  
WALKING DRAGLINES



#### GET THE FACTS TODAY

Call or write for details on how to make a time study with your own stop-watch for positive proof—or better still, ask for a Page engineer to call and prove these facts without any obligation.

25 to 45% less power required for day-after-day operation because the AUTOMATIC loads, dumps and handles faster.

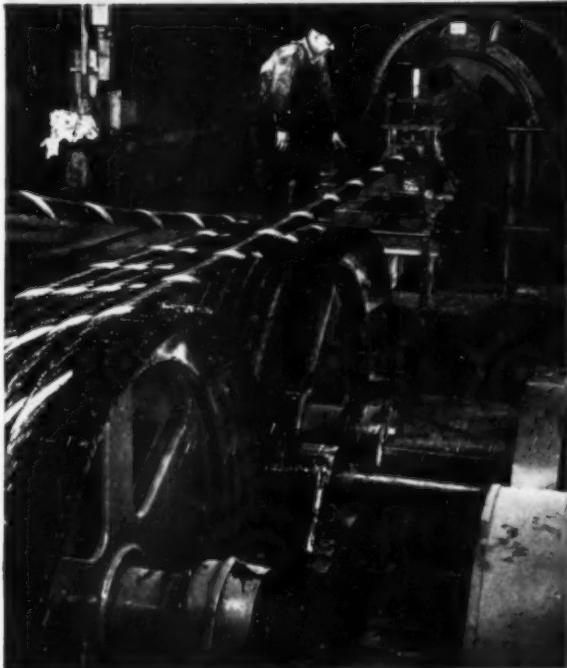
Less maintenance because the AUTOMATIC is not worn out through excessive dragging to get its load.

The AUTOMATIC always lands in digging position, digs in at first pull on the load line and never produces windrows.

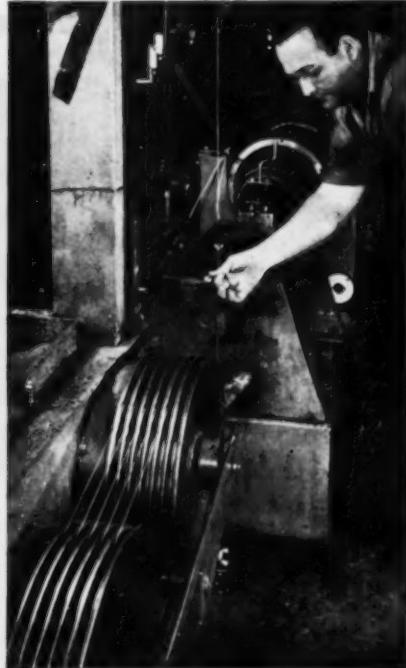
*Send for Bulletin 2049*

**PAGE ENGINEERING COMPANY**  
Clearing Post Office • Chicago 38, Illinois

This photograph shows a  $3\frac{1}{8}$ " diameter Monarch Whyte Strand Wire Rope coming off a Macwhyte closing machine. Weight of this rope is approximately 16.65 pounds per foot. It has a strength of approximately 392 tons and is used for the digging line on large dragline excavator with 35 cu. yd. bucket.



In this photograph is a  $\frac{3}{4}$ " diameter Stainless Steel Cord coming off a Macwhyte closing machine. It weighs approximately 0.35 lbs. per 100 feet; has a strength of approximately 270 pounds, and is used for many small cord needs.



**Whether you need**

## **LARGE WIRE ROPE or SMALL WIRE CORD**

You will get smoother operation and better service when you use the wire rope designed and manufactured to meet your requirements.

Macwhyte engineers are always glad to suggest the correct Macwhyte rope or cord best suited to your needs.

Just drop a card or letter to Macwhyte Company or your Macwhyte distributor.

### **MACWHYTE COMPANY**

**2931 Fourteenth Avenue**

**Kenosha, Wisconsin**

*Manufacturers of Monarch Whyte Strand PREformed, Internally Lubricated Wire Rope, Atlas Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope.*

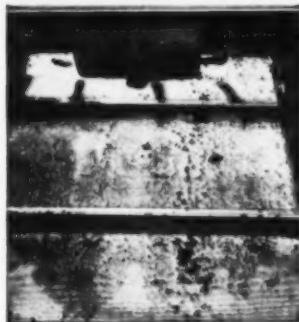
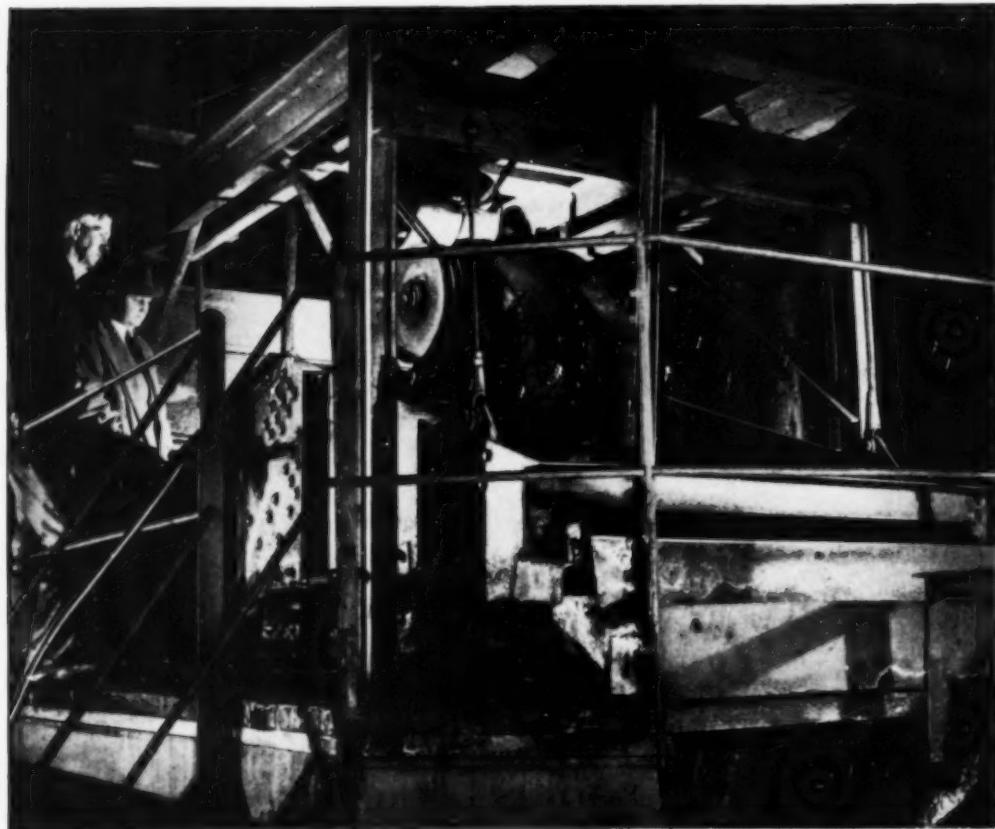
*Mill Depots: New York • Pittsburgh • Chicago  
Minneapolis • Fort Worth • Portland • Seattle  
San Francisco • Los Angeles*

*Catalog on request.*

**make your selection from**

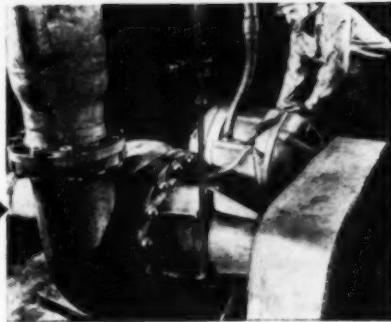
*a thousand and one*  
**WIRE ROPES**  
*made by*  
**MACWHYTE**

# "LOW-HEAD DEWATERING Paid for Itself in



CLOSE-UP VIEW of end-tension deck installed on the 5x14 ft Low-Head vibrating screen shown above. Water sprays wash the high ash fines through 20-mesh stainless steel deck. Vibrating mechanism has not been opened for repair in over five years' operation. Overflow water from settling cone is recirculated with Allis-Chalmers solids pump.

CW SOLIDS PUMP is an important part of the dewatering screen installation. This 12x10 Allis-Chalmers pump is rated 4,000 gpm; 40 ft head . . . has only five easily removable working parts. Motor is an Allis-Chalmers 60 hp induction type with Tetrope drive.



# SCREEN 37 Days!"

"WE'RE RECOVERING \$130 WORTH  
OF 4x20 MESH BITUMINOUS COAL  
FROM WASTE SLUDGE EVERY DAY"

... SAYS MR. CLAUDE CARTY  
of Hickory Grove Coal Co.  
SULLIVAN, INDIANA

#### SIMPLE ARITHMETIC

11 TPH saved every 7-hour day = 77 tons.  
Additional revenue @ \$1.75 per ton:  
 $77 \times 1.75 = \$134.75$   
Screen and Pump cost approx. 35000.  
Paid for itself: 5000  
 $\frac{134.75}{5000} = 37$  days.



AND IT'S ALL PLUS REVENUE! Twenty tons per hour of 4-mesh x 0 sludge was waste before this Low-Head dewatering screen and CW solids pump combination was installed. Now, an average of 11 TPH of 4-mesh x 20-mesh fine coal — readily salable at \$1.75 per ton — are recovered every hour. Adds up fast, doesn't it? Not only that, pumping cost is less because there's less sludge pumped to waste.

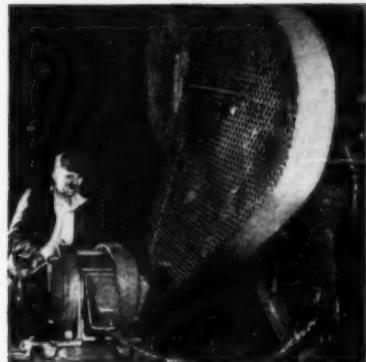
This is typical of the way Low-Head vibrating screens are turning waste sludge into profit in numerous coal washing plants! Low-Head screens are money-savers in dewatering small size coal, too. End-tension deck construction turns coal over repeatedly, assuring thoroughly efficient drainage. Low-Head screens with side tension decks are used for dewatering and sizing large coal and for pre-wetting ahead of heavy density units. Horizontal operation saves headroom, cuts installation costs. Sizes from 3 x 6 to 6 x 16 ft.

The A-C representative in your area will gladly show you how a Low-Head dewatering screen installation may pay off for you in added profits. Call him, or write for Bulletin 07B6330B. A-2792

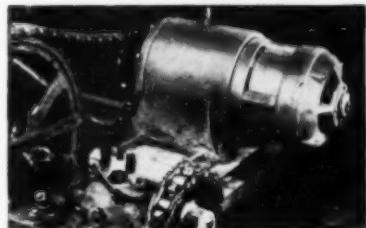
ALLIS-CHALMERS, 968A SO. 70 ST.  
MILWAUKEE, WIS.

*Low-Head, Texrope* are Allis-Chalmers trademarks.

OTHER COST-CUTTING  
PRODUCTS FOR COAL  
AT HICKORY GROVE



This 25 hp Allis-Chalmers induction motor drives a fine coal conveyor in Hickory Grove washing plant. Motor is equipped with Texrope V-belt drive. The Allis-Chalmers motor line includes totally-enclosed fan-cooled types . . . splash-proof motors . . . large dc and synchronous motors. Allis-Chalmers also builds a complete line of motor controls.

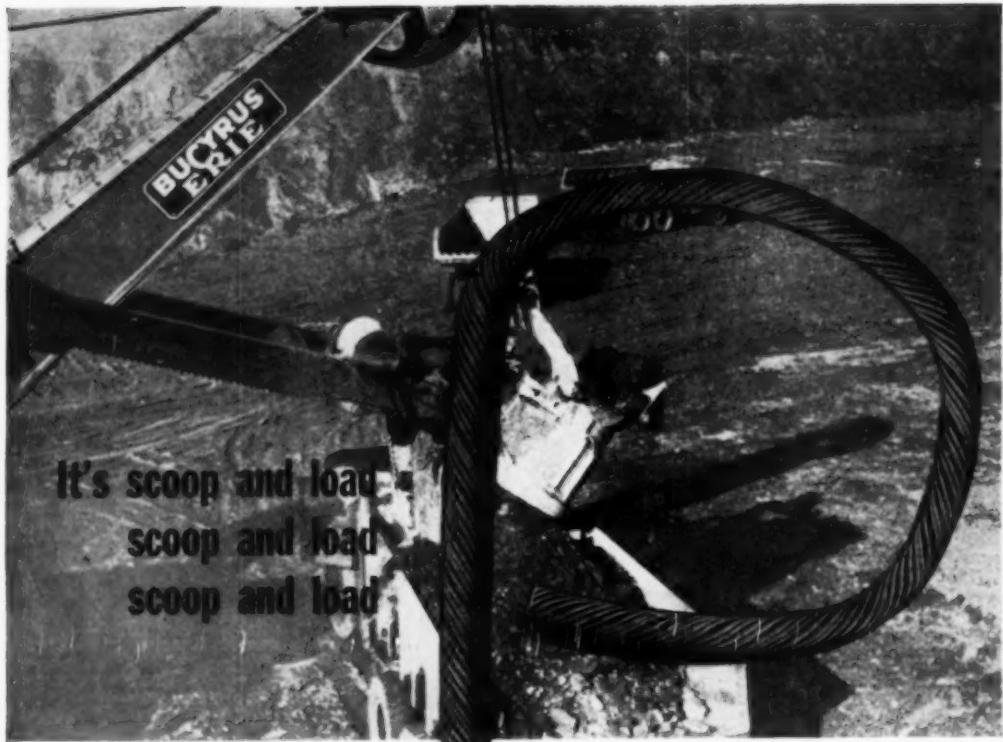


Compact 7½ hp Allis-Chalmers Gearmotor drives a surge hopper in coal washing system. In operation since 1937, only maintenance required on this unit has been lubrication. Gearmotors have high power factor, are used where slow speeds are required. Output speeds range from 7.5 to 780 rpm. One to 50 hp.

# ALLIS-CHALMERS

*... Builds for Coal Industry Progress!*





**It's scoop and load  
scoop and load  
scoop and load**

## **when you shoot with**

You keep a fast-moving procession of trucks under your shovels when you blast with Primacord. Because Primacord works to produce the kind of well-broken ground that makes digging much easier.

**Then - - - costs go down**

**... profits go up.**

## **RIMACORD**

Primacord is flexible, easy to handle and hook up with square knots and half hitches. Down-hole lines contact every cartridge; when a shot is fired the entire charge from top to bottom initiates with peak explosive power. Trunk lines can be laid out so that front holes fire a split-second before succeeding ones; this gives you relief of burden that adds a whopping jolt to fragmentation.

A non-conductor, Primacord is insensitive to stray currents, comes wound on light-weight spools in three different grades. Ask your explosives supplier which you should use . . . or write us direct.

THE ENSIGN-BICKFORD CO. • Simsbury, Conn.

**PRIMACORD-BICKFORD** **Detonating**  
**• Fuse •**

**Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry**

*Coal Age*

**SEPTEMBER, 1949**

**IVAN A. GIVEN, EDITOR**

## High Time

IS IT LIKELY that Congress will do anything about controlling union officials in the exercise of the monopoly power vested in them by specific exemption from the operation of the anti-trust laws? For this session, the answer, on a realistic basis, is "No." Too many members of Congress, it appears, will have to be educated the hard way—at the expense of the economy not to mention the troubles and added costs to their constituents.

But it is heartening that at least one group of senators is willing to dare the lightning and inquire into what is happening specifically in coal mining, where union-leader monopoly power is making itself glaringly apparent. The hearings undoubtedly will culminate in the preparation and offering of a bill or bills to curb such power. Merely eliminating the exemptions now granted to union officials, thus making them subject to the same rules as other businesses and individuals, probably would suffice, though the proposals to be expected may include supplementary regulations. These supplementary regulations may make it more difficult to get legislation passed. Again, they may not. In any event, as previously pointed out, it is possibly too much to expect any real action this session. But the future is another story. If union heads keep throwing their weight around, the next session or the session thereafter may well bring real results.

There is need for action. Both the record of events and the case presented by coal men and others from outside clearly show it. And if coal mining is to make the most of its opportunities, it must have relief from the burdens placed upon it by the arbitrary and capricious exercise of monopoly power by union officials. The past 10 years or so have witnessed major advances by employers in fitting the industry to meet its obligations not only to the fuel-using public but

to its employees. In expenditures for more-efficient production equipment, in increased wages and other benefits for miners, and in the creation and expansion of new agencies for the promotion of research in production and utilization, better service to consumers, mine safety and public goodwill, coal-mining companies have made real headway in stimulating progress. Meanwhile, regardless of the merits of their goals, union officials have been more and more arbitrary and heedless of public, employee and industry interests, thereby limiting or completely cancelling the benefits to be derived from the industry program.

It is long past time for union officials to get in step. It would, of course, be better all around if they did it voluntarily. Otherwise, the only answer is legislation to bring them to a realization of the duty they owe industry and the public, as well as their members.

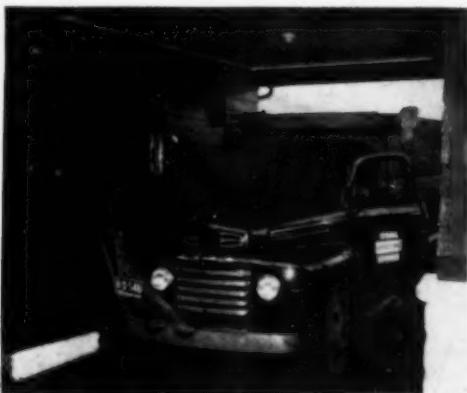
## Possibility

IT IS BECOMING increasingly clearer that considerable of the coal burned in 1949 will not be mined in that year because of the three-day week. The excess of demand over output is coming from stocks, with a number of users that can shifting—temporarily, it is to be hoped—to fuels not under Mr. Lewis' control. A complicating factor is householder complacency about the situation this coming winter. It all adds up to the fact that there could be a sudden upsurge in demand that would tax production, transportation and distribution to the limit. Since the industry certainly does not want to be charged with the responsibility for a shortage, it is perhaps well to keep this possibility in mind and lay plans to prevent it from becoming an actuality, Mr. Lewis permitting.

## Clean Deliveries by Fahrland Fuel Co., Cleveland, Make Friends for Coal



CUSTOMER'S ORDER gets courteous, careful attention from Fahrland Fuel Co., Cleveland. "Thank You" card will follow.



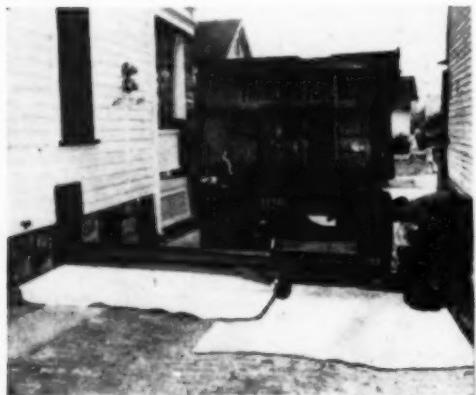
COAL IS WEIGHED. Truck must be shiny, driver's hands must be clean and he must wear CHS emblem on his cap.



COAL IS SCREENED when loaded. Truck carries conveyor, tar-paulins and broom and displays bold CHS emblem.



COAL IS SPRAYED with water after weighing to avoid spreading dust when it is conveyed into customer's basement bin.



TARPAULINS AND CONVEYOR are placed in position after driver inspects basement and bin and talks with housewife.



CLEAN SWEEP-UP of spilled coal in driveway is followed by second inspection of basement, which also is swept clean.



HOUSING DEVELOPMENTS represent a potentially big retail coal market. Coal Heating Service groups are swinging some of them to coal instead of oil or natural gas. This group of new houses in Detroit will burn coal.

## Better Coal Retailing

**Joint Producer-Retailer Merchandising Plan Gains Strength—Better Advertising, Improved Service and Cordial Customer Relations Boost Coal's Merits—How Coal Heating Service Gives Home Users a Break**

IN COAL HEATING SERVICE, the bituminous industry—producers and retailers alike—has a way to give a better break to people who warm their homes with coal and thus to stem the tide toward oil and natural gas. It is not, to be sure, the final answer to the prob-

lem of retail coal sales but it is the best thing that has yet been offered.

Coal Heating Service was conceived over three years ago when, in March, 1946, the National Coal Association adopted a plan for a joint producer-retailer program to hold coal's domestic markets by

giving retail customers a break. It was born five months later, when retailers in Detroit, Mich., formally set up the first local CHS unit. By midsummer, 1949, nearly three years later, the program embraced 67 local groups made up of 1,800 retailers selling some 17,500,000 tons a year. The current rate of disbursements now stands at \$633,000 annually, about half of which is spent for direct advertising of coal, coal-burning equipment and the services offered by coal retailers and equipment dealers affiliated with CHS.

The program has grown to its



EMERGENCY SERVICE around the clock is provided in Cleveland by telephone-answering agency.



CUSTOMER FILES of D. W. Mallory & Co., Richmond, Va., show bin size and location and delivery equipment needed.

## How Coleman-Hindley-Johnson, Inc., Knoxville, Tenn., Cleans a Furnace



FURNACE-CLEANING TRUCK, a giant-size vacuum cleaner, parks near basement window. Big vacuum bag stretches across lawn and driveway.



VENTS ARE CLEANED with brush and blower, plus suction from vacuum bag outside.



FURNACE IS CLEARED of ashes. Vacuum pipe draws dirt from upstairs vents.



STOKER HOPPER is cleaned and painted inside and oil is changed.



CLEANING JOB DONE, housewife gets a report on condition of heating plant.

present size in spite of obstacles that might have killed off a less robust enterprise. It grew during the winters of 1946-47 and 1947-48, when postwar demand for goods and services, coupled with relatively cold weather, pushed industrial and domestic fuel needs to a high level. Since fuel oil was in short supply and natural-gas distributors could not meet all their commitments, coal practically sold itself. In this period, though most retailers and producers looked ahead to a competitive fuels market, some saw no real need for strengthening their selling methods. Inertia and shortsightedness, therefore, probably were the biggest obstacles of CHS in its first two years.

The winter of 1948-49 brought a reversal of the competitive situation. Thanks to a warm winter and

some increase in refinery capacity, oil met all demands, built up stocks and even lowered prices. Likewise, natural-gas pipelines, with considerable added mileage and capacity, met the industry's commitments and even took on some new customers. Coal retailers, meanwhile, lost some customers to competing fuels and, in addition, found some 10-ton coal users dropping back to 7 tons because of mild weather.

The upshot was that a good many retailers were hard pressed to stay in business, let alone pay their CHS tonnage assessment. And now, at the end of summer, 1949, having had only moderate if any success in summer fillup campaigns and with some signs of a business recession ahead, some retailers are discouraged. They are inclined to retreat, not advance.

In addition to these broad prob-

lems, CHS regional managers, starting out to organize retailers into local groups, have had to cope with such situations as jealousies and rivalries among dealers; the desire, in some towns and cities, of one big retailer to run the show his way; one retailer's fear of losing customers to another who, spurred by CHS, improves his service and selling methods; and the difficulty of persuading individuals that CHS differs from the local retailers' association.

Nor are all the problems solved when, at last, local retailers agree to form a CHS group. In fact, the job of organizing often is easier than keeping the group going after it has been set up.

To begin with, some dealers have expected too much of CHS. They joined with the mistaken idea that there is a strange magic in CHS—

that all they had to do was sign their names, employ a manager and raise some money, and then new customers, eager to junk their oil and gas burners, would start ringing their phones the next day. They did not call on their customers to talk about CHS. They cut back their individual advertising budgets, leaving their battles to be fought by CHS. They left plans, policy, administration and drudgery to the CHS manager instead of working with him as a team. Then, when nothing big happened, they blamed CHS.

In addition, retailers here and there went into CHS simply because they did not want to be left out of something that was happening. However, when a bandwagon dealer-member failed to clean up his trucks, school his drivers and improve his customer relations, he lost customers to more enterprising retailers and went sour on the CHS idea.

#### Retailer Thinking Reflected

These, in brief, are examples of the obstacles CHS Division and its regional managers have had to contend with on the retailer side of the program. On the whole, they have handled their problems with tact and skill, preferring to suggest rather than dictate, to persuade rather than argue and to reflect progressive retailer thinking rather than shape it.

On the producers' side of CHS, the problems have not been so many or so complex. Even so, there are some producers who, not clearly understanding the program and how it works, argue that their responsibility ends when they pay their  $7\frac{1}{2}$  mills per ton to the National Coal Association. For example, at the start of the venture considerable stress was laid on the possibility that shipper salesmen, if made thoroughly acquainted with CHS principles, could form a strong link between a producer and his retailers and thus could boost the CHS program among dealers, to the common benefit of customer, retailer and shipper. Now, after three years, only one shipper, as far as can be learned, has invited a CHS representative to a meeting of his salesmen.

Another obstacle, though not a big one, has been raised by a few producers of industrial coal who have expressed doubts that CHS is doing anything for them, forgetting (1) that the National Coal Association's directors allocate funds

among several activities with a view to doing some good for all members and (2) that, unless producers of domestic coal can hang onto their markets, they soon may offer strong competition in industrial markets.

Thus the problems that CHS has met with on both sides, producer and retailer, have been many and various. That the program has survived and, in fact, prospered, is a measure of the soundness of CHS and the patient planning, the administrative skill and the hard work of retailers, the CHS staff and the members of the Marketing Committee, National Coal Association.

With three years of history now behind it, how is CHS organized and how does it work?

CHS, a division of the National Coal Association, is supervised by the Marketing Committee and staffed by a manager, a field manager and an advertising director with headquarters in Washington and by six regional managers with offices in six widely scattered cities. Generally speaking, the job of the staff is to spread CHS doctrine among retailers, help organize local groups, prepare advertising and promotional materials for use by groups, analyze quarterly reports on activities and finances submitted by local units and feed ideas and suggestions to individual groups to win public favor for coal as the best home heat.

#### Self-Rule for Retailer Groups

A CHS organization must represent a substantial percentage of the retail tonnage sold in its city or area. The size of the group, however, is of no real importance. For instance, in Emporia, Va., which has a population of only 3,000 or so, one coal retailer, selling about 5,000 tons annually, together with an electrician and a heating equipment dealer as affiliates, has set up a CHS unit to serve Emporia and the outlying district. By contrast, 164 retailers in and near Detroit, Mich., selling close to 2,000,000 tons a year, form the biggest of all CHS groups.

The difference in size between these two groups illustrates the flexibility of CHS. It is not a strait-jacket program. Each group is independent and autonomous. That is, each unit is free to buy or not to buy advertising and promotional materials from CHS headquarters. Each group sets up its own various committees to suit its needs. In Cleveland, for example, a governing

board made up of officers and trustees initiates consideration of projects and then appoints a special committee to activate each project. In St. Louis, on the other hand, standing committees on advertising, public relations, service standards, finance, press relations and membership think up projects and carry them through to a conclusion.

Assessments also are left to local groups, with the National Coal Association matching whatever funds are collected up to 2c per ton. Some 52 groups have fixed the assessment at 2c on total tonnage sold. However, in Pueblo, Colo., the assessment is 5c; in Peoria, Ill., 1c. In Detroit and Grand Rapids, Mich., and Duluth, Minn., members pay 2c for home sales and 1c for steam sales.

Individual groups decide how they will spend their money. In 1948, the Knoxville group spent about one-third of its money for newspaper advertising. In Cleveland, some 65% of total funds currently goes to newspaper advertising, the remainder being spent for booklets, direct mail, supplies, administration and operating costs. On the average, about 50% of the total income to local groups goes directly to advertising, with newspapers getting the biggest share.

Though each group is autonomous, there still is a broad pattern of activity throughout all CHS units, a stronger hold on coal's retail markets being the target everywhere. The various groups are going about their job by advertising and by improving the quality of their service and stepping up their customer and public relations programs. Here is how their activities add up:

**ADVERTISING** — Generally, over two-thirds of the money spent for advertising goes for newspaper space and direct mail. The Richmond, Va., group, for example, spent some \$5,500 for advertising in 1948, the bulk of it in newspaper space to a total of some 5,200 column-inches. In Richmond, more than half of the members never had bought newspaper space before CHS was organized. Now their names are listed with other members in group advertising and they are beginning to buy newspaper space individually.

The approach in CHS group advertising is education rather than sales pressure. Usually the themes are that coal heat is comfortable and safe, that the right firing methods and good equipment make it

## Advertising and Better Customer Service Build Goodwill for Coal

clean and convenient and that coal dealers are prepared to give good service with their product.

Because radio time is costly, to mention only one reason, CHS groups are not using radio time as extensively as newspaper space. However, the St. Louis group aims a quarter-hour musical broadcast at housewives three mornings a week; the Milwaukee outfit broadcasts three 15-min sports roundups a week, offering prizes for the best hunting and fishing hints sent in; and the Richmond unit, in the heating season, buys spot time in connection with the weather broadcast.

Dollars spent are not always a true index of advertising gains. In Cleveland, for instance, through the influence of the CHS manager, two Bituminous Coal Institute films, "The Magic of Coal" and "Underground Adventure," and a Norfolk & Western Ry. film, "Power Behind the Nation," have been televised by a local station as a public service. Along these lines, the CHS group in Salt Lake City gained prestige without cost through the display of the CHS logotype and emblem in advertising copy of the Utah Power Co. and some Utah coal producers.

In addition to enlarging the total bulk of coal advertising and showing the value of advertising, the CHS program adds sparkle to the story retailers tell in their own advertising by providing interest-catching themes and new ways of telling about coal's merits.

Integration of the individual retailer's advertising with that of the CHS group is done expertly in Richmond, Va., to mention only one place. There, in mid-July, when the summer fillup campaign began to lag, the CHS manager sent a letter to each member describing group advertisements scheduled for the remainder of the summer—"Mr. Squirrel Has the Right Idea" is a typical lead-off. "Why not," he urged, "take a second look at the schedule and arrange your advertising to tie in on the same dates and, better still, on the same page as the CHS ad?"

**SERVICES AND CUSTOMER RELATIONS**—CHS is teaching retailers who did not know it already that "plus" sales of coal depend on good will. Here are some of the things CHS retailers and groups are doing to boost good will for coal among their customers and the general public:

1. The quality of deliveries is being improved, even in those cities

where deliveries were clean and careful before CHS was organized. Generally, trucks now are shinier than before; rubber-tired wheelbarrows, tarpaulins and conveyors are more widely used to protect lawns and driveways; and some dealers have uniformed their drivers neatly either by sharing the cost of new uniforms or by splitting the cost of laundry service. In Cleveland, about 70% of the drivers for CHS members are uniformed. To see that customers in Richmond, Va., are kept content, over 90% of all coal deliveries are personally inspected by some responsible member of the firm that sold the coal.

Driver training has a great deal to do with better deliveries. In Cleveland, for instance, retailers and the Ice & Coal Drivers & Helpers Local 422 (AFL) joined together last winter to school coal-truck drivers. Just before the union's annual Christmas party last December, over 150 drivers met at the union hall to talk about better deliveries and see a slide film, "Let's Look at Better Deliveries." Elsewhere, in Knoxville and Richmond, for example, dealers have schooled their own drivers in small groups, a method which they find more satisfactory in view of local labor conditions. Instruction includes traffic courtesy as well as clean deliveries.

2. Twenty-four-hour emergency service now is available to customers whose heating equipment breaks down. The usual arrangement is to handle emergency calls, especially at night, through a telephone-answering service that serves other businesses and professions as well. In her files the telephone operator has the name of each CHS dealer and, if he does not handle equipment, the name of his service affiliate. When a call comes in, the operator transmits the message to the dealer or his affiliate. Within a few minutes, someone is on his way to find the trouble and correct it. To speed service and cut costs, the St. Louis CHS group is planning to zone the city, thus enabling the telephone-answering service to dispatch a repairman from the customer's neighborhood.

Naturally, emergency service is not free. However, prevailing fees are reasonable and usually a code drawn up by CHS safeguards customers against "gyp" service. To most customers, prompt and conscientious attention to their needs is more important than a reasonable fee.

3. Dealers are showing more interest in how their coal performs

and how their customers are using it. Along these lines, CHS groups are telling coal users that clean burning equipment in good operating condition gives better heat and are inviting them to ask for a furnace inspection and cleaning. St. Louis CHS, only recently organized, now is drawing up a code to assure customers of a good cleaning job at a fair price. In Knoxville, Tenn., retailers and equipment affiliates last year drew up a standard checklist to be used by furnace-cleaning men. When the job is done, the checklist is signed by the cleaning crew chief and posted in the basement.

In thus helping their customers get better results from coal, CHS retailers and equipment men also are creating opportunities to sell replacement parts, repair jobs, controls, and new stokers and furnaces. In Knoxville, for instance, out of 5,000 furnaces cleaned in the summer of 1948, 1,000 prospects for new repair parts were found. Likewise, when 1,256 heating plants were inspected in May and June, 1949, in Minneapolis and St. Paul, Minn., only 10% were found to be in good condition, the remainder needing major or minor repairs. In addition, 33 prospects for new heating plants were turned up, resulting in 15 sales by mid-July.

4. Some retailers are making it easier for their office staffs to handle telephone customers quickly and pleasantly. D. W. Mallory & Co., Inc., Richmond, Va., for example, has placed next to the telephone a Kardex file with a card for every customer showing bin capacity, number of rooms in the house, type of storage (whether cellar, shed or garage), type of equipment needed to make cleanest delivery, kind of heating plant and other data. With the files at her elbow, the office girl quickly gets the whole story on the customer when he calls in, thus eliminating unnecessary and sometimes annoying questions and giving the customer the feeling that he is favored with special treatment and is well remembered for his last order.

A supplementary system, using a different-colored card for each kind of coal sold, tells the Mallory office staff at a glance which customers have not yet ordered this year, as well as what kind of coal they use. Thus in the summer, if there is a surplus of one kind of coal in the yard, the colored cards indicate likely summer fillup prospects. This system often amounts to more than a mere sale. It tells

the customer that his dealer is interested in his needs and wants to serve him well.

5. In several cities—Cleveland, to mention only one—CHS has engaged the telephone company to monitor calls to coal dealers for a period of time and to follow the monitoring with a training course in telephone courtesy for coal-company personnel.

6. In Richmond, D. W. Mallory & Co., Inc., sends a "Thank You" card after delivery of every order to an old customer and a personal letter of thanks to every new customer. The Fahrland Fuel Co., Cleveland, also sends a "Thank You" letter after each delivery, together with an inexpensive gift, such as a measuring spoon, for the housewife.

7. The personal factor is being used extensively to cultivate good will for coal and those who sell it. Some dealers in St. Louis, to whom customers are said to have been only a telephone voice for 20 years, now are making door-to-door calls. Elsewhere, in Cleveland, salesmen of the Pacific Coal & Supply Co. are dividing the city into sectors, ringing doorbells and making personal calls to learn about their customers and to sell coal, coal equipment and coal service.

8. Furnace-tending service still is in the experimental stage but in some cities it may grow into a sizable operation later because it offers coal users the advantage of coal heat without the usual inconveniences. In Durham, N. C., CHS in 1948-49 sponsored a one-man furnace-tending business that served 43 customers. His contract involved making the rounds once every day, refilling the stoker hopper, removing the clinker and disposing of the ashes as needed. The charge was \$2 per week for an ordinary residential stoker. This summer, this same man turned to furnace cleaning, thus keeping himself in business the year around. CHS advertising carries his name as an affiliate, although he pays no assessment. Four CHS dealers in Knoxville, with the assent of the group, will start a similar service this coming winter on a trial basis.

9. In some areas, CHS groups are cooperating with other businesses to promote coal use, with the result that coal's public relations are getting a boost. In several southeastern cities, plans now are taking shape for a campaign in September to sell coal-burning space heaters, usually handled by furniture and hardware dealers. Already, in Knoxville, 39 furniture

and hardware retailers have agreed to join CHS in promoting and advertising stoves. A furniture man in Danville, Va., remarked that this was the first offer of cooperation he had ever had from coal dealers, though his cabinet heaters have created business for coal retailers for many years.

10. In many other ways, CHS groups are exploiting various ways of getting coal's story across to the public at large. Take a look, for instance, at the activities of the Knoxville group for the quarter ended March 31, 1949. They include the following: showing a film, "The Magic of Coal," to two civic clubs and the Knoxville Furniture Dealers' Association; using the telephone-answering service to make 100 personal calls to homeowners to tell the CHS story; sponsoring an address by J. E. Tobey, president, Appalachian Coals, Inc., before the Knoxville Industrial Club; mailing promotional pieces to civic clubs and opinion leaders; talking about CHS with local building-and-loan associations; feeding information to local newspapers and radio stations; and sponsoring special window displays of heating equipment by affiliate members.

#### CHS Accomplishments

With such activity in advertising, service and customer and public relations, what has CHS accomplished?

At this stage, retail tonnage gained or lost is not a fair yardstick. There are too many variables—weather, price and the cost of competing fuels, to mention only three—and the program must be viewed as a long-term enterprise.

However, individual CHS members as well as CHS groups have made some real advances in influencing the choice of coal over oil and natural gas in several real-estate developments. Here are three examples:

Knoxville, Tenn.—Forest Hills Village; estimated annual coal use, 1,050 tons.

South Bend, Ind.—Two developments totaling 372 homes; estimated annual coal use, 2,300 tons.

Milwaukee, Wis.—Two housing projects totaling 560 units; estimated annual coal use, 2,610 tons.

Another measure of the success of CHS is what it has done for the retailer and his morale. Although it may not have pushed his tonnage up, it has given him new competitive tools, showed him how

other retailers are fighting for their tonnage, given him a slogan and an emblem signaling a new deal in customer relations and united him with other retailers and equipment dealers in a common cause. In short, CHS provides a way for coal retailers to command resources for developing favorable attitudes toward coal that no one retailer, acting alone, could command for himself. In this respect, if not in immediate increases in sales, CHS is making good headway.

What lies ahead for CHS?

That depends, to some extent, on the more active participation of coal shippers and producers. As stated earlier, there is no magic in the mere payment of dues to the National Coal Association. CHS is a joint effort and producers as well as retailers have a big stake in its outcome. To get better results, producers should miss no chance to work along with retailers in the following ways:

1. Urge salesmen to preach CHS principles and methods to dealers.

2. Invite CHS field and headquarters representatives to sales meetings.

3. Use their personal acquaintance with dealers to boost CHS through letters, phone calls, invocations and other communication channels.

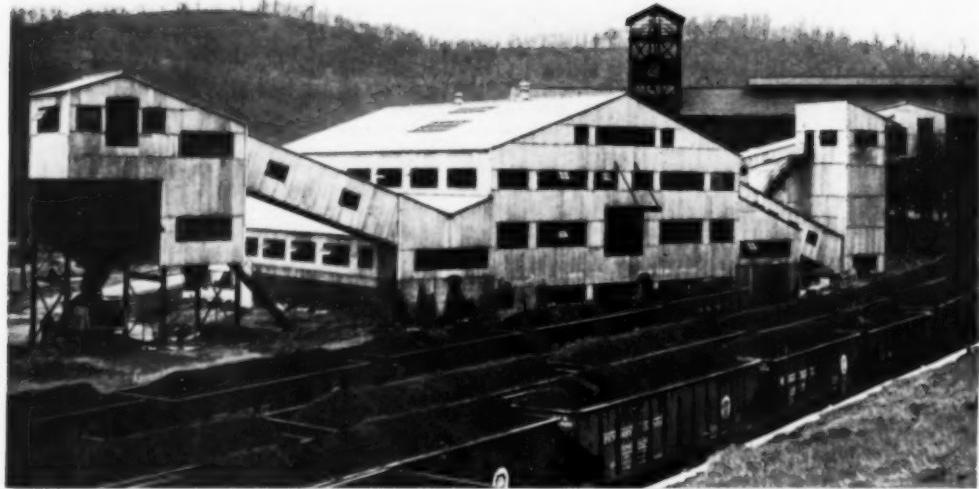
4. Strive to keep the good will of retailers by refusing to by-pass them with "club cars" and by holding the line in their agreements on the difference between retail and industrial shipments.

5. Keep on sending to market clean, high-quality coals with a minimum of screenings.

6. Continue to improve coal preparation.

CHS still has not explored all possible avenues for winning good will for coal, such as close tie-ins with annual civic clean-up campaigns, fire-prevention week and similar special occasions. Also, something probably could be done along the lines of periodic regional schools or open forums that would pool the know-how of coal-preparation experts, stoker engineers, equipment dealers and retailers to create a better mutual understanding of problems, sales methods and opportunities. These things may come in good time.

Meanwhile, CHS has made good progress from the beginning and now, after three years, has proved its worth. It is, thus far, the best tool the retailer has. It is doing a good job until something better—if possible—comes along.

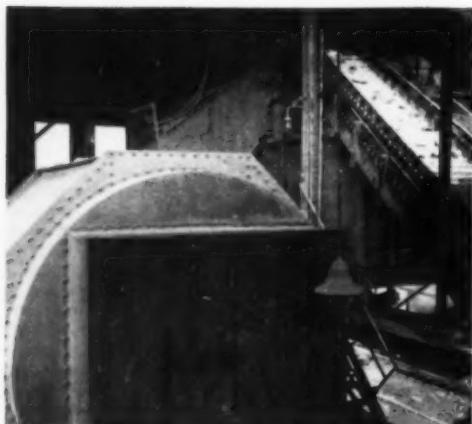


NEW MARIANNA PLANT erected near existing tipple features duplicate washing circuits and design simplification for efficient operation and reduced maintenance. Duplicate concrete sludge tanks above ground extend along opposite sides of the building, with the refuse bin at the left and the crushed-coal surge bin between the plant and the tipple.

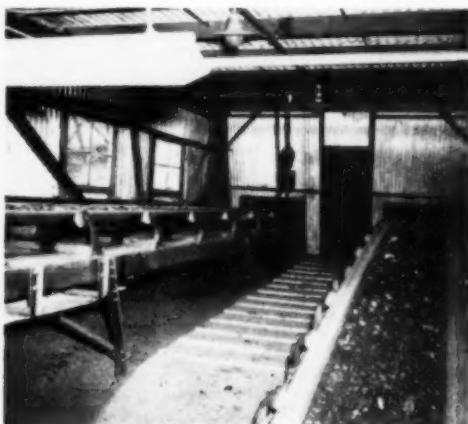
## Marianna Preparation

Two Parallel and Independent Washing Circuits Provide a Total Capacity of 600 TPH—Simplicity an Outstanding Plant Feature—Four Horizontal-Shaft Screenless-Type Centrifugal Filters Solve the Drying Problem

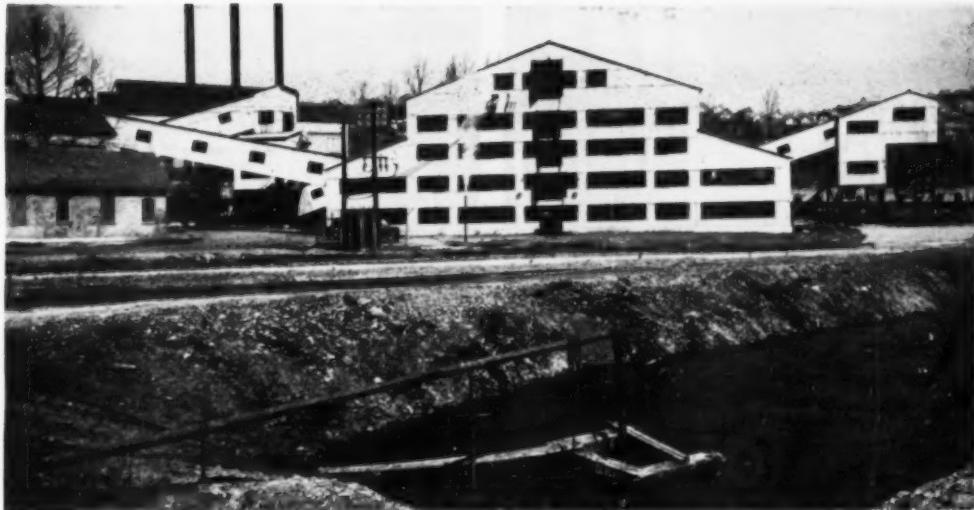
SIMPLICITY IN THE DESIGN AND OPERATION of the new 600-tph washing plant at Mine No. 58 of the Bethlehem Collieries Corp., subsidiary of the Bethlehem Steel Corp., is indicated by the relatively small operating crew and, particularly, by a very small main-



CYLINDRICAL BREAKER installed under the existing tipple crushes mine output to 5x0-in. Conveyor at right elevates rock to a 20-ton bin. Coal goes via belt conveyor to a surge bin.



TWO 42-IN BELT CONVEYORS transfer the crushed coal from a 100-ton surge bin to the duplicate 300-tph jigs installed for cleaning the coal.



**WASHING AND FILTERING** in the 5,000-ton-a-day plant is carried on in a closed water circuit with no discharge to the nearby stream. The sludge tanks are drained periodically to the settling pond in the foreground. Heavy machinery is located on or near the ground floor of the basementless structure and machinery and other equipment are painted bright contrasting colors.

tenance crew even though the plant has been operating over a year, working two shifts and handling 5,000 tons of raw material per day. Two Baum-type jigs, each a part of a duplicate washing circuit, wash the 5x0-in. crushed mine-run. The  $\frac{1}{4} \times 0$ -in., collected from two 90,000-gal sludge tanks, is dried in continuous screenless horizontal-shaft type centrifugal filters.

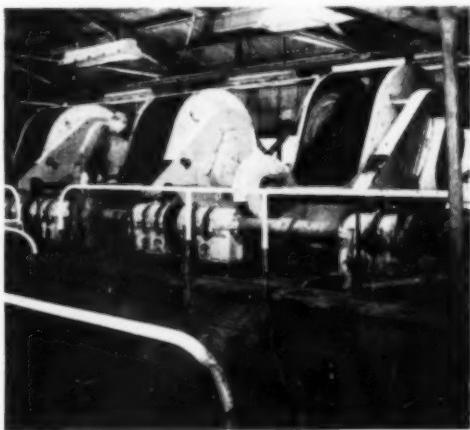
Mine No. 58 at Marianna, Washington County, Pa., is a shaft oper-

ation in the Pittsburgh seam. The coal,  $5\frac{1}{2}$  ft thick, is topped by 12 to 20 in. of draw rock. A recent modernization of underground methods to incorporate 100% mechanical loading and full-seam mining called for the construction of a washing plant that would handle material containing 30 to 35% reject.

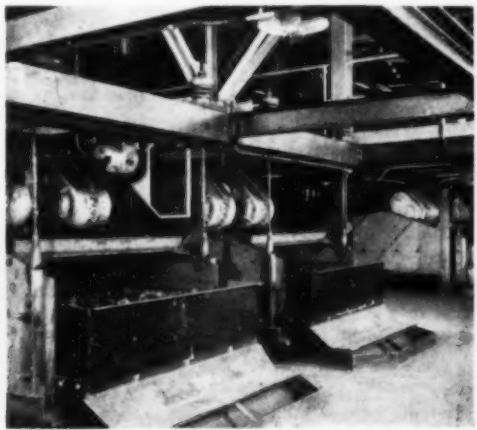
The existing tipple was utilized in connection with the new plant, which is located far enough to one

side that belt conveyors can be used for feeding the raw coal and returning the cleaned coal for loading into railroad cars. Roberts & Schaefer Co. were engineers and contractors for the new plant.

General design of the plant fulfills the maintenance man's dream, since there is no crowding of machinery, heavy equipment is installed on the ground floor or close to it, and there are no basement or sub-level pits. Machines, drives,

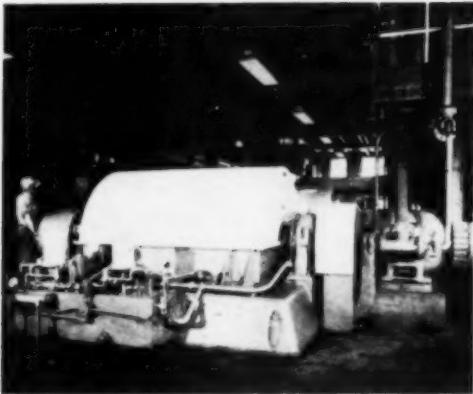
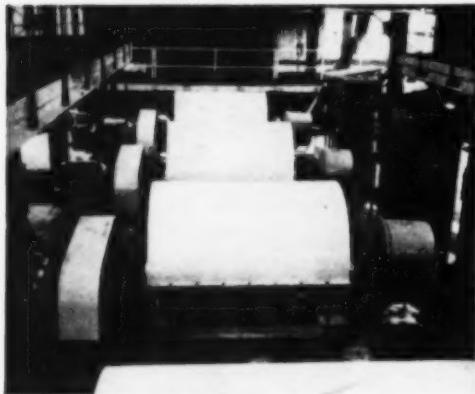


**PLANT DESIGN** permits feeding 400 tph to either of the duplicate coal-washing jigs should shutdown of either half of the plant be necessary.

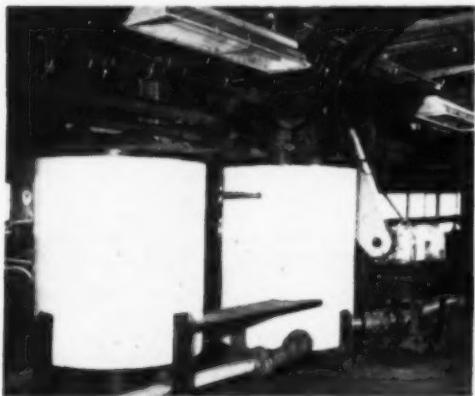


**EACH PAIR** of 6x16-ft vibrating screens receive washed coal from one of the two jigs, dewatering and sizing it into  $5\frac{1}{4}$  and  $\frac{1}{4} \times 0$  prior to further processing.

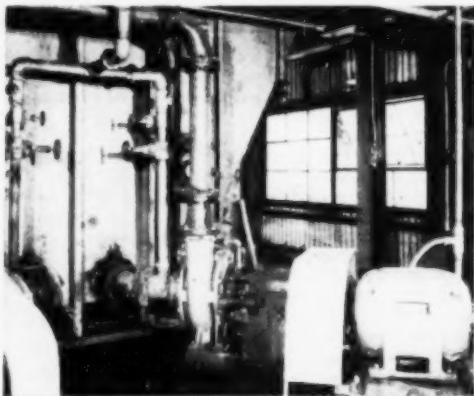
## Centrifugal Filters Reduce Moisture in Fines and Clarify Water



FOUR HORIZONTAL CENTRIFUGAL FILTERS reduce surface moisture of the  $\frac{1}{4} \times 0$ -in to 11.0% and clarify the water. Electrical controls under adjustment by the operator are shown at the right, with oil-storage and filtering equipment for one unit lower left.



MIXING and distributing tank (right) routes fine coal to the filters. Effluent tank (left) delivers water to the sludge tank.



FOUR WATER-SEALED PUMPS—two of which are spares—deliver sludge to the mixing and distributor tank.

pipes and other equipment are painted in bright contrasting colors. The structure is steel, the upper floors are checker steel plate and the roof and sides are corrugated Transite. Since the site is an old fill which was made when the shaft was sunk, 200 piles consisting of 12-in H-beams, some 30 ft long, were driven to support the foundations.

The first unit of the new plant consisted of a cylindrical breaker 10½ ft in diameter and 19 ft long with 5-in round hole screen plates, driven by a 60-hp motor. It was installed above ground under the existing tipple so that coal dumped from the hoisted mine car moves to it by gravity over a reciprocating feeder driven by a 20-hp motor. Two 30-in apron conveyors, driven by 7½-hp motors and installed one

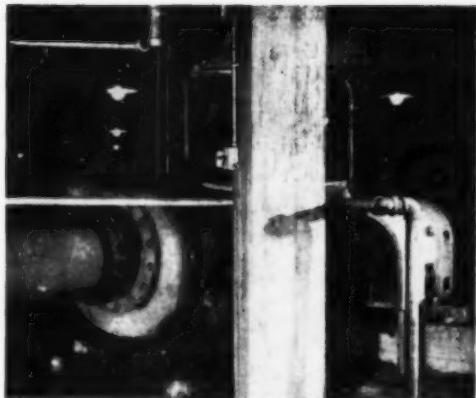
above the other, elevate the mine rock from the breaker to a 20-ton truck-loading bin under the tipple.

Crushed coal from the breaker is conveyed and elevated to a 100-ton surge bin by a 48-in belt conveyor 185 ft long (c-c), driven by a 50-hp motor. From the bin, adjustable-speed reciprocating feeders transfer the raw coal to two 42-in belt conveyors, each of which discharge to one of the jigs. One belt is 110 ft long and the other 140 ft. Each is powered by a 30-hp motor. While the normal capacity of each jig is 300 tph, in an emergency involving the shutdown of one washing unit the feed to either 42-in belt can be stepped up to 400 tph, which is the top capacity one unit is capable of handling with reasonable efficiency.

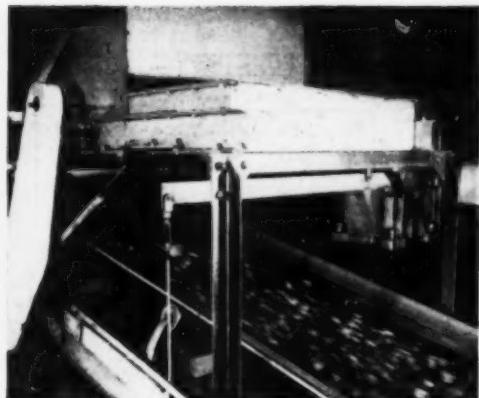
The jigs are 84-in three-compartment

units, with air at  $3\frac{1}{4}$  psi supplied by a rotary positive blower powered by a 50-hp motor. Air valves are driven by one 3-hp motor, the three elevators by a 10-hp motor and the refuse ejector by a 20-hp unit. Two elevators discharge refuse and the third discharges middlings, which are separated on a 4x10-ft double-deck vibrating screen ( $\frac{3}{4}$ -in square-mesh cloth on top and  $\frac{1}{4}$ -in square on the bottom) in  $5 \times \frac{3}{4}$ -in,  $\frac{3}{4} \times \frac{1}{4}$ -in and  $\frac{1}{4} \times 0$ -in. The  $5 \times \frac{3}{4}$  and  $\frac{3}{4} \times \frac{1}{4}$  are reduced to  $\frac{3}{4} \times 0$  in a 24x30-in hammer mill (50-hp drive) and, together with the  $\frac{1}{4} \times 0$  in, are pumped back to the jig feed.

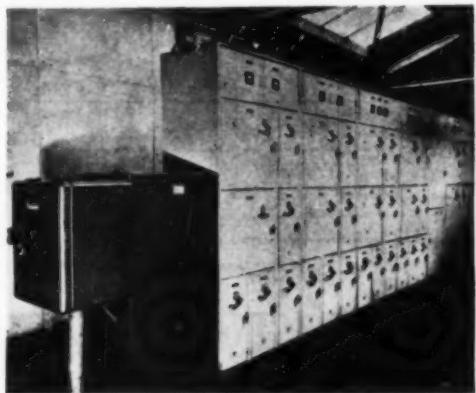
The washed coal from the jig flows over a stationary screen with  $\frac{1}{4}$ -in slots, which drain off some of the water and the fines for direct sluicing to the sludge tank. The



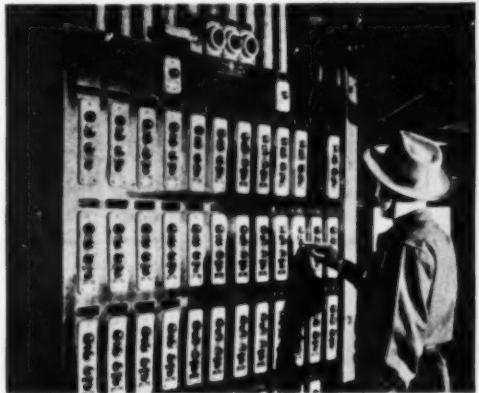
5,000-GPM UNIT pumps 1,200 gpm from the sludge-tank overflow to one of the jigs.



PLANT OUTPUT is recorded on weighing unit on 48-in belt conveyor and is checked against mine-car and railroad-car weights.



A PORTION of the 440-volt controls at the top center of the plant. Controls for the 2,300-volt motors are across the room.



PUSHBUTTON PANEL on the jig-operating floor controls 45 motors. Filter and auxiliary motors have panels adjacent to them.

washed coal then divides to two 6x16-ft screens of the low-head mechanically-vibrated type, which separate the remainder of the  $\frac{1}{4}$ x0-in. These fines also go to the sludge tank, while the dewatered  $5\frac{1}{4}$ -in gravitates directly to the clean-coal conveyor—a 48-in belt conveyor 260 ft long driven by a 50-hp motor and conveying the washed product back to the tipple. The 6x16-ft screens have  $1\frac{1}{4}$ -in square-mesh cloth on the upper deck and  $3/16$ x2-in stainless steel cloth on the bottom deck. Each screen is driven by a 20-hp motor.

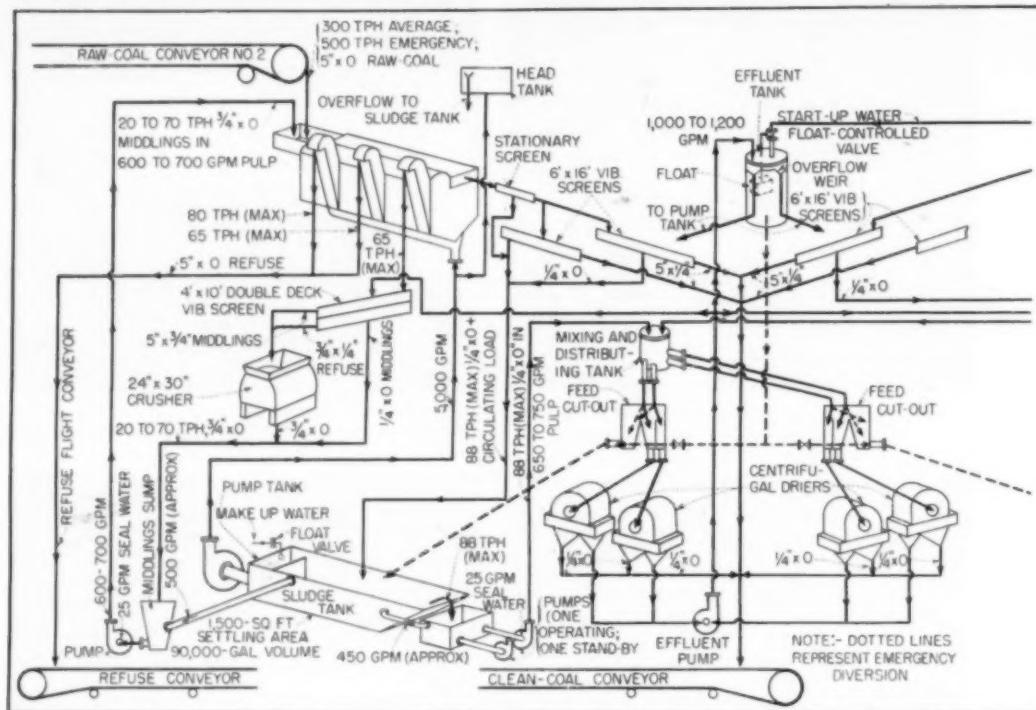
Division of the plant into two units includes sludge tanks and pumps. Each tank, utilizing reinforced concrete construction, is 20 ft wide at the top and 15 ft at the bottom and has 1,500 sq ft of settling area. The scraper conveyor,

driven by a 30-hp motor, carries flights consisting of 9-in channels 14 ft 8 in long and spaced on 18-in centers. The material is scraped into a separate compartment, where a mixer with 10-hp drive keeps it stirred for feeding to a 5-in water-sealed pump (30-hp motor) delivering to a mixing and distributor tank serving four centrifugal filters. The distributor tank is common to both halves of the plant. A complete spare unit with valve connections is installed beside each 30-hp pump for use if either requires maintenance.

Crushed middlings ( $\frac{3}{4}$ x0-in) are elevated back to the jig by a water-sealed pumping unit identical with the pumps mentioned in the previous paragraph, except that it is driven by a 15-hp motor and is not accompanied by a spare unit.

The new-type continuous centrifugal filters without screens have a maximum basket speed of 650 rpm. Their drives are 150-hp 875-rpm slip-ring induction motors with rotor-resistance speed control. Each filter is equipped with an oil-pumping and filtering system. To guard against overloading or clogging, each unit is equipped with a load-beam device that records the torque required to convey coal through the filter on a graphic chart. If the danger point is approached, the control activates a Thrustor-operated valve to by-pass the feed to the mixing compartment of the sludge tank. The filter is automatically stopped if the torque increases beyond a safe value or drops to zero because of the breakage of a shear pin (Coal Age, March, 1949, p 112). Dried

## Plant Design in Harmony With Community Design for Pleasant Living



MARIANNA FLOWSHEET—50-in coal from a 100-ton surge bin following a cylindrical breaker (not shown) is split to duplicate washing

coal from the four filtering units is collected by a 24-in belt conveyor 75 ft long driven by a 10-hp motor and discharging to the clean-coal conveyor.

Since the centrifugal filters are highly effective in removing solids, the plant is operated with a closed-circuit water system and absolutely no water from the washing circuit is discharged to the adjacent Ten-Mile Creek. Water plants grow in abundance in the shoals of the creek and game fish are present. A long narrow sludge pond between the plant and the creek is provided for periodic discharge of the sludge tanks. Water from the sludge pond is pumped back to the head tanks for re-use in the plant. At intervals, a clamshell loads the accumulation into trucks for disposal on the refuse dump, which is back over the hill about a mile.

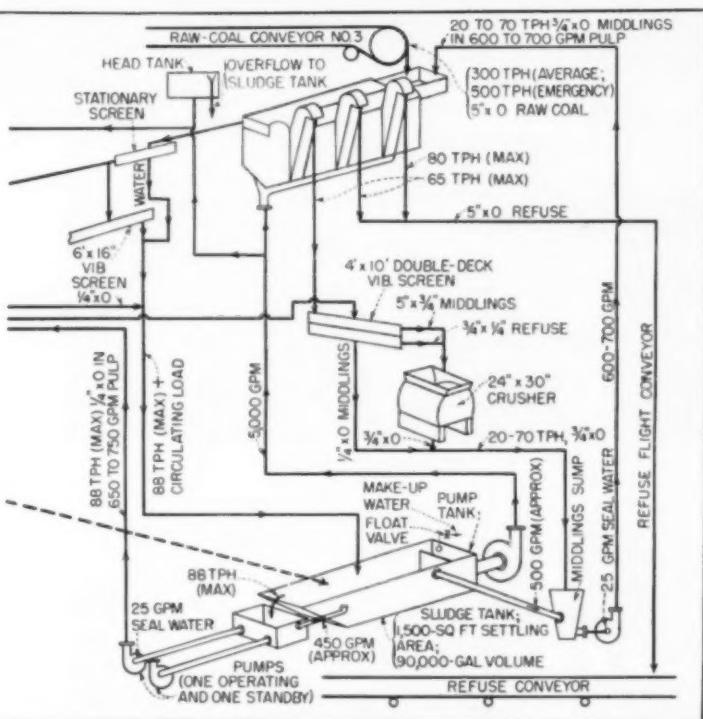
In addition to the sludge-tank drags, the only two flight conveyors in the plant are a pair of 30-in x 45-ft units driven by 15-hp motors which carry refuse from the jigs to the refuse belt conveyor. The belt conveyor, 30 in wide, 165 ft long and driven by a 20-hp motor,



PLEASANT LIVING RESULTS from Marianna community design, featuring trees and well-kept lawns.

transports the entire plant refuse to a 150-ton bin, from which it is loaded to K14 diesel trucks with tandem rear-end 4-wheel drives. The road to the dump is hard-surfaced and the loads carried average 12 tons.

Coal washing is performed at a 1.50 gravity. On a typical day of two underground shifts, totalling about 10 hours of actual plant operating time, 4,948 tons of raw material is handled, 1,617 tons of which is reject and 3,331 tons



circuits, either of which can handle 400 tph in an emergency.



COMPANY HOUSES AT MARIANNA MINE feature good construction and large lots facing wide streets.

cleaned coal that is shipped. Weightometers on the raw-coal belt conveying to the surge bin and on the clean-coal belt record rates and totals. These totals are checked against mine-car weights secured on the bottom before hoisting and

against the railroad-car weights.

The seven-man crew employed in the plant for each of the two operating shifts consists of five operating men, a sampler and foreman. The operating men include the jig operator, filter operator, mechanic,

laborer and breaker man. One mechanic and one helper are employed on the third or off shift.

Practically no coal dust is in evidence in the plant proper. In addition to the fact that the coal is fairly damp from spraying underground, crushing is done in the closed breaker outside under the tipple, the clean-coal belts are fed at the outlying surge bin and water sluices the crushed mine-run from the conveyor discharge into the jigs.

In the color scheme throughout the plant, motors and drives are painted green; guards and railings, yellow; and tanks, etc., cream. All water piping is painted black and steam piping, aluminum.

Total connected horsepower of the plant is 1,780. Motors of 100 hp and above are 2,300 volt. All others are 440-volt. There are two 100-hp motors and four 150-hp. The four 150-hp motors powering the centrifugal filters are the only units of the wound-rotor type. Magnetic switches, starters and power-factor-correction capacitors filled with Askarel liquid are grouped in a Transite-lined room equipped with skylights at the top center of the plant. The push-button control board for the 45 motors (not including those for the filters and their auxiliaries) is located on the jig-operating floor near the center of the plant. Filter controls are adjacent to the filter units. The 440-volt power is stepped down from 2,300 by an outside substation, consisting of three 250-kva transformers adjacent to the plant. Plant wiring in rigid conduit is arranged in simplified direct and parallel runs that are a delight to the eye.

A trip through the washing plant, followed by a tour of the miners' substantial brick homes widely spaced on well-kept lawns and wide streets, suggests to visitors that the plant designers must have first viewed the company houses. The plant interior carries out the community plan, which is characterized by the substantial construction, lack of crowding and pleasant surroundings.

A. F. Peterson is president of the Bethlehem Collieries Corp. K. M. Quickel is manager and T. J. Crocker is assistant manager. L. H. Chalfant is division superintendent, Ellsworth Division; William Benzon, superintendent, coal preparation; T. J. Jones, superintendent, Marianna mine; and J. G. Stoner, general foreman and first shift foreman of the plant.



TAKING TOP 2 ft thick and approximately heading width with duckbill in No. 4 mine.



STOWING ROCK in room with swivel and telescopic trough.



SLED AND PLATFORM elevate and move discharge trough.

## Brushing With Room Stowage

Duckbill and Shaker Conveyor Used to Brush Headings and Stow Rock in Rooms at Williams Coal No. 4 Mine—Five-Man Crew Averages Removing and Stowing 25 Ft of Rock 6 Ft Wide and 2 Ft Thick per 6½-Hr Shift

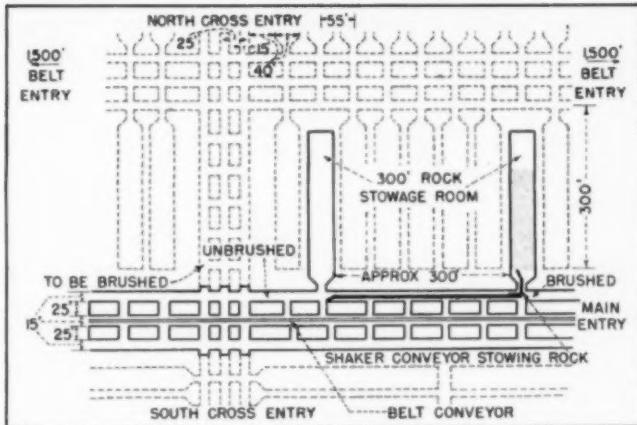
TO PROVIDE CLEARANCE for its 6-ton drop-bottom cars, it is necessary for the Williams Coal Co. to take approximately 24 in of rock in the haulage headings at No. 4 mine, Mannington, Ky. Using a duckbill, a five-man crew averages 25 ft of brushing 6 ft wide and 2 ft thick per shift of 6½ hours,

stowing the material in special storage rooms.

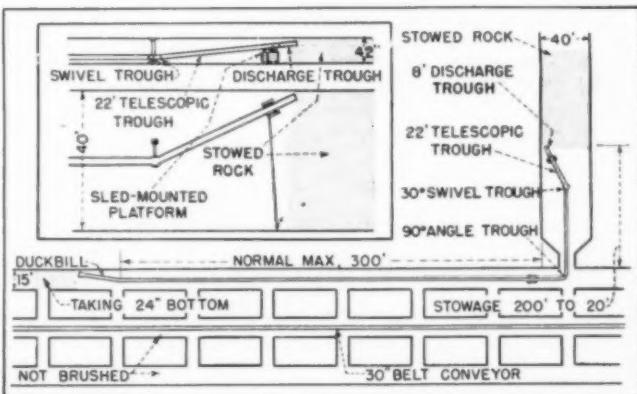
The seam mined is the No. 6, averaging approximately 42 in throughout the mine. Some gentle rolls are present, but in general the seam is flat. To maintain grade, it frequently is necessary to brush into the hard, massive slate form-

ing the normal top. Wherever possible, however, it is preferred to lift the medium-hard but wet fireclay bottom rather than drill and shoot the hard top, which has no parting. Underlying the fireclay, averaging 24 in in thickness, is 4 to 10 in of hard sandstone and 6 to 24 in of fireclay on a hard, massive sand. When the overlying fireclay is less than 24 in thick, it is necessary to cut into the 4 to 10 in of sandstone.

The Main West triple-heading entry at No. 4 mine has been driven from the bottom with duckbills. The headings are 15 ft wide on 40-ft centers. The right-hand head-



BRUSHING AND STOWING PLAN No. 4 mine, Williams Coal Co.



MAIN-ENTRY PLAN at No. 4 mine, showing brushing and stowage arrangements.

ing is brushed to a height of 66 in for track haulage. The mine acreage is bisected by the Main West entry. The south side of the mine has been disturbed by many small faults branching in all directions from a major northeast-southwest fault. Because of this condition, south room-panel entries on 700-ft centers are driven directly off the main. The north side of the mine is laid out for east and west room panels off north cross entries turned from the main.

Triple-heading cross entries are projected on 3,000-ft centers on the north side. Panel entries driven 1,500 ft east and west off the cross entries will be on 700-ft centers. The first panel will be turned at 435 ft off the main. Belt conveyors in the center headings of the panel entries gather from room and de-

velopment shakers. The belts discharge into cars on the cross entries. The right-hand heading on each cross entry will be brushed for track haulage.

In advancing the main entry, a standard 40-ft-wide room is driven 300 to 320 ft deep every 300 ft to the right of the entry. These rooms provide space for stowing the rock brushed from the right-side haulage heading as the brushing crew follows along behind the duckbill entry-driving units.

Entry brushing, following entry driving, is done by a crew of four men and a boss, using a G20B70 shaker conveyor equipped with Size 1½ troughing and a Size ESH21 duckbill, a hoist to pull the duckbill ahead, a jackhammer with portable air compressor and 90-deg angle trough.

The top or bottom, depending upon the grade required, is shot and loaded onto the shaker conveyor, placed on the center line of the heading, by the duckbill. A 90-deg angle trough back of the drive turns the shaker conveyor into the room, previously driven by the entry crew.

The rock is stowed tightly top to bottom across the 40-ft room by means of a swivel trough at the discharge end of the conveyor followed by a 22-ft telescopic trough and an 8-ft discharge trough. The telescopic trough is swung across the room by a chain jack. The discharge trough is held up near the roof by a sled-mounted platform pulled across the room with the trough by the chain jack. The rock is packed tightly against the top, without hand work, by the shaking and tamping action of the pan line.

In starting to fill a room, the discharge end of the conveyor is placed about 200 ft in. As stowing takes place, the telescopic trough is retracted. A 13-ft length of trough is then removed and the telescopic trough is replaced and extended to the correct position for a renewal of stowing. Troughs are removed in succession until the room is filled to the neck.

#### Stowing Area Matches Output

Two lineal feet of rock 24 in thick and 15 ft wide from the heading can be stowed in one lineal foot of room 40 ft wide and 42 in high. Thus, each room will accommodate the rock from 350 to 400 ft of heading brushed full width. When the heading trough line has been extended about 300 ft, the drive, 90-deg angle and discharge end are moved 300 ft ahead to the next storage room to repeat the cycle.

The five-man crew consists of a duckbill man, helper, driller, discharge man in the room and a boss. Average production is drilling, shooting, loading and stowing 25 ft of heading per 6½-hr shift. Haulage brushing normally is 6 ft wide and 24 in thick. The 300-ft move-up requires four men two shifts.

Although considered the most economical method of loading out the bottom, installation of the system was deferred because of fear of difficulty in handling wet fireclay and rock on an uneven sandstone bottom. When it was tried, however, it was found that the duckbill equipment did exceptionally well handling the wet fireclay and working on the uneven bottom.



EASY ACCESS to garage (foreground), warehouse and shop is provided by wide parking apron and well-kept yard area.

## Strip-Mine Service Center

**Shops, Garage and Supply Room Housed as a Unit—Layout Streamlines Repair and Maintenance Jobs—Department Duties Clearly Defined—Perpetual Inventory**

**Utilized—How Machine Shop Built Big Shovel Stick**

AN INTEGRATED LAYOUT housing machine shop, electrical shop, garage and supply warehouse provides a smooth flow of materials and parts from storage to working areas as well as space and facilities

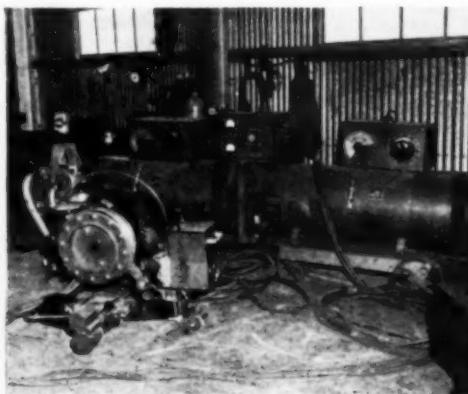
for repairing and maintaining pit, haulage, preparation and electrical equipment and for fabricating shovel sticks and dippers and other heavy items at the Tiger mine, Hume-Sinclair Coal Mining Co.,

Hume, Mo., near the Kansas line.

Grouped about 5 miles east of U.S. Highway 69, some 60 miles south of Kansas City, the shop-warehouse-garage, the preparation plant and the mine office are located approximately in the middle of the company's present land holdings. The preparation plant lies about 100 yd southeast of the shop-warehouse-garage — close enough for motors, screens and other plant parts to be moved easily to and from the shops. The mine office, some 200 yd south of the garage



RADIAGRAPH, here poised after beveling small plate, was used to bevel long side plates of stick before welding. The self-propelled machine employs an acetylene flame.



WELDING was done by continuous automatic machine, self-feeding and self-propelled, at rate of 9 in per minute. The flame area is entirely enclosed.



WAREHOUSE STOCKS are kept up to needs by perpetual inventory.

apron, is distant enough from the plant and from passing trucks to provide a quiet working place for engineers, clerks and mine officials.

The shop-warehouse-garage building forms an L, with the shop and warehouse forming the north-south upright of the L and the garage forming the base at the south end of the warehouse. The garage, measuring 66x215 ft, with 10 roll-up doors serving as ports for trucks and trailers, is built of concrete block with steel trusses and framework and with a gypsum-block roof. A door leads directly from the garage into the warehouse.

The warehouse, measuring 59x132 ft, and the machine shop, 59x84 ft,

are built of corrugated steel sheeting on a steel framework and are connected by a door. Thus the warehouse, located centrally between the garage and the machine shop, provides an easy flow of materials and supplies to either working area. An area approximately 25x25 ft is partitioned off in the northwest corner of the warehouse to house the electrical shop. At the north end of the machine shop, opening to the shop yard, a 20-ft-wide door provides passageway for big machine parts.

Building materials of the warehouse and machine shop, as pointed out, are such that these two structures can be knocked down for removal to another location when

the present lands are worked out. The garage, however, will be only partly salvageable, the steel framework and trusses being recoverable and portable. No move is planned for some time to come, since properties to the north and west have not yet been mined. Just now, three pits are being worked—one  $2\frac{1}{2}$  miles southwest of the mine buildings, another  $2\frac{1}{2}$  miles south and a third 5 miles southeast.

The functions of the four units of the integrated structure—garage, shops and warehouse—are clearly defined. The garage is responsible for maintenance and repair of all gasoline, butane and diesel equipment, pumps (except motors), the 38-A Marion dragline and the 200-W Bucyrus-Erie walking dragline. Mobile equipment taken care of by the garage force includes the following:

1 heavy-duty winch truck.

1 light winch truck.

7 70-ton semitrailers.

5 30-ton semitrailers.

1 40-ton semitrailer.

14 Dart tractors. Tractors for the 70-ton semitrailers are powered by Waukesha engines; and those for the 30-ton semitrailers, by G.M.C. 671 engines rated at 200 hp. A Cummins 400-hp diesel without supercharger soon will be tried out on a heavy tractor.

1 D-7 Caterpillar dozer.

1 D-6 Caterpillar dozer.

1 R-2 Caterpillar dozer.

2 Caterpillar motor patrols—one No. 12 and one No. 112.

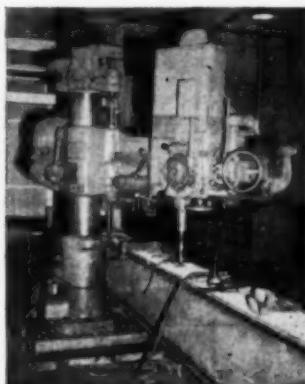
Extra engines and some heavy spare parts, including rear ends and transmissions, are kept in a



STRUCTURE of stick, including outside plates, angles and baffles, is shown by M. H. Shorter, shop man.



NEARLY FINISHED, stick was swung under big drill. Good housekeeping is the rule throughout service center.



RADIAL DRILL made bolt-holes for racking and dipper. Clean welds can be seen along entire length of stick.

## Garage-Shop-Warehouse Layout Speeds Maintenance at Strip Mines



MACHINE SHOP, where the 63-ft-long 8-ton dipper stick was built, is well equipped to maintain 24-hr service for the stripping units.

fenced-off area in the garage instead of in the adjoining warehouse, where they would be harder to get to. A 2-ton Yale-Brownie chain hoist mounted on an overhead track makes it easy to move engines and heavy parts from one place to another in the garage. Lighter spare parts, of course, are stored in the warehouse, the entrance to which is just next to the desk in the garage.

Machining and welding jobs needed by the garage force are sent directly to the machine shop, passing either through the warehouse straight into the shop or around the outside of the building and in through the north door of the shop. Crankshaft and cylinder regrinding, however, is sent to specialists in Kansas City.

Although there is no fixed schedule for overhauling tractors and other equipment, the garage force checks, greases and services all mobile units twice a week, keeping a careful lookout meanwhile for parts that need replacement or repair. To service equipment and keep it in good operating condition, the garage payroll lists one mechanic and one helper on the day shift; one mechanic, helper and a fireman on the night shift; and two oilers on the owl shift and a tire man.

The warehouse is manned jointly by C. B. Umphenour, in charge of all parts for mobile equipment, and Carl L. Newman, who is responsible for all other items of supply, requisitions, invoices and the daily record of receipts and checkouts. As far as size permits, materials and parts for all operations—drilling, stripping, loading, haulage,

drainage and preparation—are stored in the warehouse. Outside, in the big yard area, the heaviest shovel parts are stored.

A card filing system maintained by Mr. Newman keeps a perpetual inventory of supplies, materials and parts on hand. A record of every item coming into the warehouse is transferred from invoice or bill of lading to inventory card. Every outgoing item listed on a requisition likewise is charged off on the inventory card. Backlogs of supplies and parts to be kept on hand are based on experience with replacement, the number of spare items ranging from one up to four or more depending on anticipated need.

For storing small items, 704 steel bins, 18x24 in., are ranged against the west wall of the warehouse. In addition, ranged in two tiers parallel to and in front of the bins, 130 steel shelves of various sizes have been provided for longer truck parts and light shovel parts. Bins and shelves are numbered serially as a help in classifying and locating whatever is needed.

Truck and shovel parts that are too large for the bins or shelves yet small enough to be brought inside the warehouse conveniently are arranged in groups on the open floor, each group containing the parts belonging to one piece of equipment. Wire rope up to 1 1/4 in. in size, for the loading shovels and draglines, is placed in a special area on the floor, as are electrical coils, motors and switches. A 5-ton Yale-Brownie chain hoist is mounted on overhead rails to simplify the movement of heavy items into or out of the warehouse, as



MERLE GUTHRIE, superintendent, oversees all operating and service divisions.

well as to the adjacent machine shop or the garage.

The electrical shop, where Charlie Courtois is foreman, is responsible for all electrical construction, maintenance and repair, except for winding big armatures, which are sent to nearby Pittsburg, Kan. Electrical work around the plant and the shops and in the pits requires the work of seven men in addition to Mr. Courtois. Their jobs range from simple repair and maintenance chores to the erection of all 33,000- and 4,000-volt high-lines and the transfer of portable substations from one location to another. This latter job, Mr. Courtois points out, requires only four hours from shutdown to power-on.

The machine shop, where Roy Houck is foreman, is outfitted with the following major pieces of equipment:

1 Cincinnati-Bickford Super-service radial drill, bought from the War Assets Administration.

2 smaller radial drills.

1 LeBlond horizontal lathe with a 20-ft bed and a 36-in swing.

1 Atlas lathe, 12 in.

1 Racine utility saw, 18 in.

1 Hendy shaper.

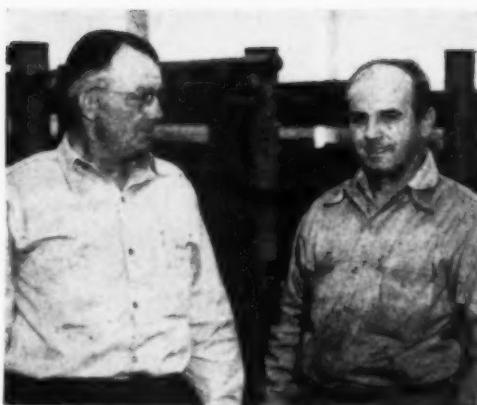
1 Oster-Williams bolt machine, which cuts threads up to and including 1 1/4 in.

3 hand welding machines, 300 amp.

1 Airco DB Radiograph, 110 volts for beveling sheet or plate steel.

1 Lincoln automatic welding machine, combining two 600-amp machines under a single set of controls for continuous welding.

2 5-ton and 2 2-ton Yale-Brownie chain hoists.



ROY HOUCK (left) and Charlie Courtois are foremen respectively of the machine shop and the electrical shop.



C. B. UMPHENOUR (left) and C. L. Newman run the big warehouse and keep check on inventory.

Fourteen men are on the machine-shop payroll. Since stripping continues 24 hours a day, two welders are kept on duty on the second shift and one on the owl shift to take care of any emergencies.

With well trained workmen and first-class equipment, the machine shop is able to do some pretty big jobs. A recent project, for example, was to build a 63-ft-long 8-ton dipper stick for the 55-60 Marion shovel. The job, Mr. Houck reports, was done in approximately 140 man-hours. The main structural elements in the big stick were as follows:

Top and bottom plates of  $1\frac{1}{2}$  in steel  $13\frac{1}{4}$  in wide and 63 ft long; side plates of  $1\frac{1}{2}$  in steel 21 in wide and 63 ft long. When boxed, these plates formed a rectangle whose outside cross-section dimensions were  $13\frac{1}{4} \times 24$  in.

Seventy-two 6x8-in angles of 1-in plate steel placed at equal intervals inside the rectangle and acting as braces where top and bottom plates were welded to side plates.

Eighteen  $9\frac{1}{4} \times 19$ -in baffles of 1-in steel plate, fitted snugly against the inside angle braces and thus supporting the inside framework.

Thirty-five  $1\frac{3}{4}$ -in bolts in the lower end of the stick where it joins the 35-yd dipper and 45  $1\frac{1}{2}$ -in bolts to accommodate the racking.

The first step in preparing the 63-ft plates for fitting was to bevel the outside lengthwise edges of the two side plates. For this job, the Aireo DB Radiograph, shown in

one of the accompanying photographs, was used. Employing an acetylene flame and propelling itself along its own tracks at a fixed speed, it sheared the corner off the edge of the steel plate and left a smooth beveled surface turned 45 deg from the side of the plate.

Welding the whole structure together was done with the Lincoln continuous automatic welding machine, which moves under its own power along a predetermined track at a governable speed. For the outside lengthwise welds, where the top and bottom plates were joined to the beveled edges of the side plates, two passes of the automatic welder were used to fill the trough. For the first pass, 5 32-in filler, wound on a spool, was used; for the second and finishing pass, 7 32-in filler, also on a spool, was used.

The welding machine, shown in one of the accompanying photographs, requires neither goggles nor head shield, since the flame area is entirely enclosed. A vacuum pickup following close behind the weld disposes of unburned flux. The finished weld is smooth, clean and practically flawless. Tank controls are mounted on single panel between the two stationary tanks. Speed of movement, feed and weld are controlled by dials on the mobile part of the machine, which carries its own flux hopper. Welding of the dipper stick was done at the rate of about 9 in per minute. A total of 14 hours' work completed the welding job.

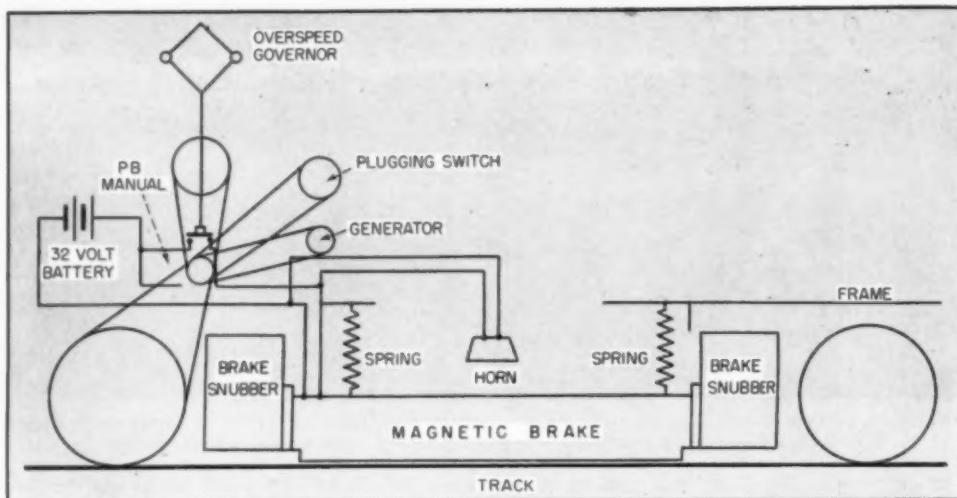
When the welding was finished, chain hoists were used to spot the near-finished dipper stick under the big Cincinnati-Bickford radial

drill, which drilled out two holes for each of the 80 bolts for the dipper and the racking. Since the big drill is fixed in position, the chain hoists were kept in place to inch the stick along for each new drill hole.

When the stick was finished, a heavy two-wheeled dolly was backed into the machine shop through the large door at the north end and the stick was hoisted aboard. From there, it was pulled by one of the Dart tractors out to the pit, where it was put in place on the shovel.

To add winter comfort to working conditions in the shops, the supply room and the garage, Hume-Sinclair has installed a stoker-fired furnace-fan heating system in the elbow of the L formed by the buildings. The furnace, heat exchangers, blower and ducts, designed and built by the E. K. Campbell Heating Co., Kansas City 3, Mo., who also installed the heating plant in the nearby tipple, provide inside warmth for the men and protects pipes and machinery against freezing temperatures (*Coal Age*, July, p. 88).

The entire layout—garage, warehouse and shops—is arranged to provide top working efficiency for repair and maintenance, easy access and communication among the three units and minimum distance for hauling equipment and parts between the pits and the mine buildings. With his office only a stone's throw away, Superintendent Merle Guthrie, along with the chief engineer, the weighmaster and the bookkeeper, is located within easy reach if he is needed at the shop-warehouse-garage, the preparation plant or any one of the pits.



BRAKING SYSTEM on mancar includes steel-block brake, snubbers, battery, generator, governor, horn and push button.

## More Safety for the Mantrip

**Home-Designed Mantrip Car Uses Magnetic Track Brakes to Provide Safe Transportation on Slope—Brakes Set Automatically When Car Exceeds Safe Speed—Horn Sounds When Brakes Are On—Other Features Add to Safety**

MAGNETIC BRAKES which clamp down on the top of rails and thus stop the car by friction are the big safety feature in a new home-designed mantrip car used on the slope at the Lake Creek mine, Consolidated Coal Co., Johnston City, Ill.

Paralleling the slope belt for a distance of about 1,000 ft, the haulage tracks are inclined 15 deg. Company engineers found, upon investigation, that the ordinary type of safety dog was not satisfactory for a slope as steep as this and that conventional wheel-drum brakes, though they stopped rotation of the wheels, did not prevent the car from skidding down the slope with locked wheels, the braking or friction area being confined to the point of tangency between rails and wheels.

It was clear also that the usual type of drop-latch would not provide the degree of safety sought, for it would jerk the car to a sudden stop and thus catapult the men

off their seats, with consequent danger to life and limb. Likewise, the usual derail, though it certainly would stop the car, would throw the upper end of the car into the air and hurtle the men sharply forward and upward. In addition, undesirable features caused officials to abandon their plan for a second cable on the slope, firmly hitched at both ends. Braking effort would have been applied to this safety or stationary cable in much the same way as grips are used on cable cars.

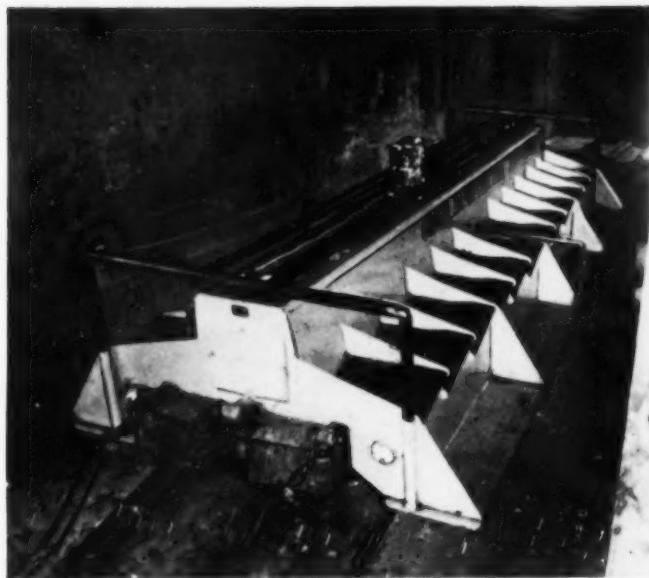
Meanwhile, having noted the use of electric track brakes on trolley cars in some cities—St. Louis, for example—company officials had specified installation of this type of brake on new locomotives. Careful study of friction factors and braking effort of this type of brake when used in locomotive operation indicated that the electric track brake might be the answer to the mancar problem.

Accordingly, design of the new car was begun. Construction was

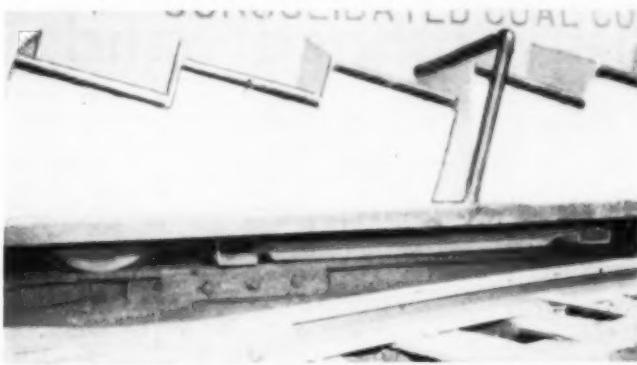
completed some months later. As the car now stands, having been in use long enough to indicate its merits, two steel blocks containing electrical coils are suspended by springs from the underside of the car frame directly above the tracks. A 32-volt battery is carried inside the car. When the circuit is closed, the current passing through the coils in the steel blocks magnetizes the blocks, which thus are drawn down upon the rails to provide friction braking. The entire brake assembly is manufactured by General Electric Co.

Battery-charging equipment aboard the mancar is similar to that in ordinary automobiles and trucks. In addition, auxiliary charging equipment is located at the top of the slope, where the car normally is at rest. Brake batteries thus can be kept fully charged, whatever the number of trips the car makes during a given period.

A fly-ball governor geared to the wheels and mounted in a transparent plastic cage on top of the car automatically closes the electrical circuit and thus sets the brakes when the car moves in excess of a predetermined safe speed. Company officials point out that a more modern type of governor easily could be installed inside the car, where it would not be visible.



NEW MANTRIP CAR, designed and built by Consolidated Coal Co., is equipped with magnetic track brakes for emergency stops on 15-deg slope. Fly-ball governor sets brakes when car moves too fast. Angled seats provide a level ride for passengers.



STEEL BLOCK, magnetized by electric coil and thus drawn down on rail, stops car smoothly but surely by friction.

However, the present governor in its plastic cage is reported to have a good psychological effect on mancar passengers, assuring them that the mechanism is working and that the company actually has done something to make the mantrip safer.

In addition to the automatic control provided by the fly-ball governor, a white pulcord runs the full length of the car within reach of every passenger. A pull on this cord closes the electrical circuit and sets the brakes. This manual con-

trol has been provided in case a passenger sees some reason for stopping the car along the slope, such as a fall, a man on the tracks or a broken rail.

Officials and workers alike report that the magnetic track brakes bring the car to a firm but smooth stop in a short distance, about as if a driver were bringing his automobile to a quick stop. Smooth deceleration is made possible by the fact that speed is a factor in friction, friction (in this case, braking effort) increasing as speed drops.

To make safety doubly safe, the mancar is equipped with a loud horn which begins sounding immediately upon application of the brakes and continues to sound until the brakes are released after the slack in the cable has been taken up. Brakes are released by pushing an enclosed pushbutton on the inby end of the car. The horn warns the hoisting engineer that the car has stopped somewhere along the slope and thus signals him to take up slack in the cable. Without some warning to the engineer, the brakes would have to be kept set, thus weakening the batteries and gradually releasing the brakes. Company safety rules require that when the horn sounds, the engineer, the top foreman and the mine manager must be notified immediately and must come to the slope at once to investigate.

When the brakes are set, sealed-beam headlights on the outby and inby ends of the car are automatically turned on. When the car is in motion, a directional relay turns on the headlights in the direction of travel.

The mancar seats 24 men, 12 on each side, facing at right angles to the longitudinal axis of the car. Open construction of the car, together with arrangement of the seats along the length of the car, makes it possible for all the men to unload in no more time than it would take one man to get clear.

#### Level Ride up Slope

Pivoted brackets of steel pipe are mounted at the top near the inby end of the car. When swung out at right angles to the length of the car, one of these brackets provides support for one end of a stretcher, the other end being supported at a point about midway the length of the car. Thus, using both brackets, two stretcher cases can be given a level ride up the slope in case of accident underground.

The Consolidated Coal Co. has applied for a patent on the entire mancar assembly and principle. Furthermore, the magnetic track brakes have performed so well that the shop workers now are building a pilot car on the same principle. The pilot car will be attached to the rope when materials are being lowered down the slope and the material cars will be attached to the pilot car rather than to the rope. In this way the same degree of safety will be obtained for lowering materials as has been achieved for moving men up and down the slope.

**Storage Bin in Unused Mine Shaft Permits Four Simple Steps in . . .**

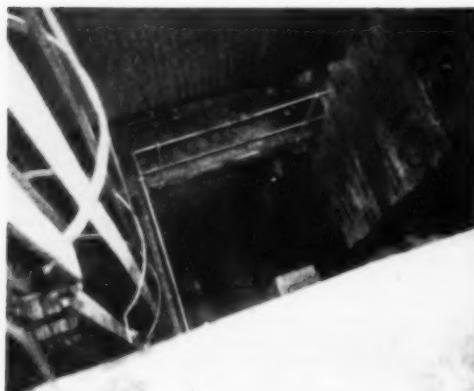


**1** PREDRIED LOCOMOTIVE SAND purchased in 50-ton lots to cut cost of drying and handling is dumped from railroad cars into this under-track dump hopper . . .

## Saving With Predried Sand

**Old Mine Shaft Utilized for Gravity Sand Chute, Vibrating Screen and 70-Ton Storage Tank at Consolidation Coal Co. (W. Va.) Eliminates Handling and Cuts Labor—Sand Discharged at Mine Bottom as Needed**

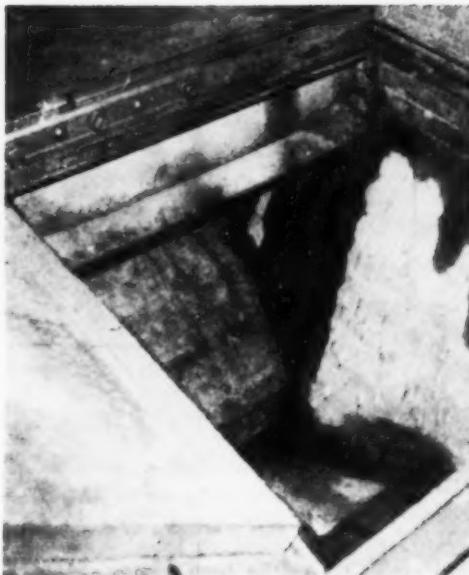
SAND DRYING has been eliminated and handling labor both on the surface and underground has been reduced to what appears to be nearly the absolute minimum at the Williams mine, Consolidation Coal Co. (W. Va.), Nora, near Fairmont,



LOOKING DOWN toward the screening platform. Ladder is guarded (left) and entire shaft is fenced in [Photo 1 above].



JESSE G. BOWERS (left), superintendent, Williams mine; and R. M. Sherbs, safety inspector, northern-division mines.



2 FLOWS BY GRAVITY down old unused 54-ft shaft from bottom of dump hopper shown here to . . .



3 VIBRATING SCREEN on a platform 15 ft below the surface that feeds it to top of 70-ton steel storage tank, which . . .

W. Va. The predried sand is purchased and delivered in railroad cars. From the railroad-car dump hopper it flows by gravity to a 70-ton storage bin, from which it is drawn off as needed through a spout at the mine bottom—an entirely mechanized operation.

The mine is an old shaft operation taken over a few years ago by Consol and re-opened with a new slope in which a belt was installed. The old hoisting shaft, only 54 ft deep and within 50 ft of the present tipple, has been utilized for a sand chute, vibrating screen and 70-ton sand-storage bin. The bin, which is a steel tank 7 ft in diameter and 32 ft long, is equipped with a discharge spout and valve at the center of its conical end 9 ft above the track on the main bottom of the mine.

A steel and concrete platform inside the shaft about 15 ft from the top holds a motor-driven screen with 3/16-in wire mesh, through which the sand flows on its way from the dump hopper to the bin. This Allis-Chalmers 24x72-in "Aero-Vib" unit screens a 50-ton carload of predried sand in 75 min, the time required to unload a car. Members of the tipple crew handle the unloading.

A quarried silica or glass sand is purchased and is delivered in



4 DISCHARGES SAND as needed on mine bottom via spout and control, here demonstrated by Jesse G. Bowers, superintendent.



closed-type hopper-bottom cars. A limit of 50 tons shipped per car is specified so that a carload can be ordered when the bin supply drops to 20 tons. As a result, a new supply can be unloaded without delay with one spotting of the car. Since the tipple track over the dump hopper is only 10 ft or so from the

shaft, sufficient slope in the underground chute to cause the sand to flow freely was easily arranged in installation.

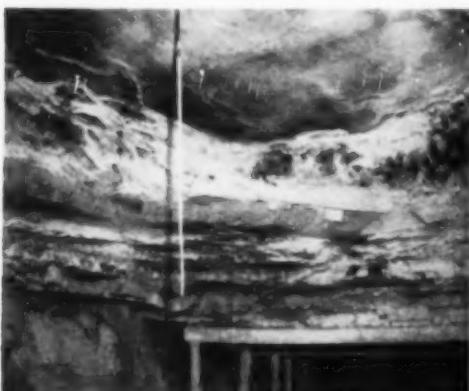
With installation of this gravity-type sand-handling equipment in May, 1948, the former practice of taking the sand down the new slope in supply cars was discontinued.



ROOF BOLTS supplementing crossbars in Booth No. 6 mine have reduced roof falls to a small fraction of the former percentage.



BOLT FAILURE as a result of drilling hole too big caused fall of 3½ ft of top material at this intersection in Booth No. 6.



ANCHORING ERROR, with bolts in drawslate, caused fall on one side of room, leaving slate on other side hanging on the bolts.



BOLTS KEEP TOP UP after crossbar removal for test purposes in a worked-out place in Booth No. 6 used for gobbing refuse.

## Small Bolts Hold Bad Top

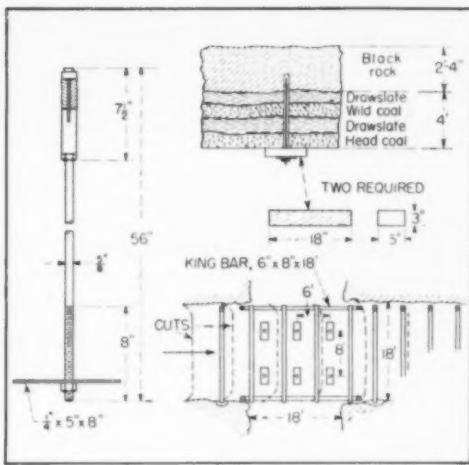
Falls Reduced 80% in Pittsburgh-Seam Mine by Supplementing Crossbars With  $\frac{5}{8}$ -In Bolts and Expansion Shells  
—Crossbars Supplanted in Sewickley-Seam Operation  
by  $\frac{3}{4}$ -In Bolts Installed With Wedges

SUCCESSFUL APPLICATIONS of suspension bolts for roof support have far outweighed the three failures in the Pittsburgh and

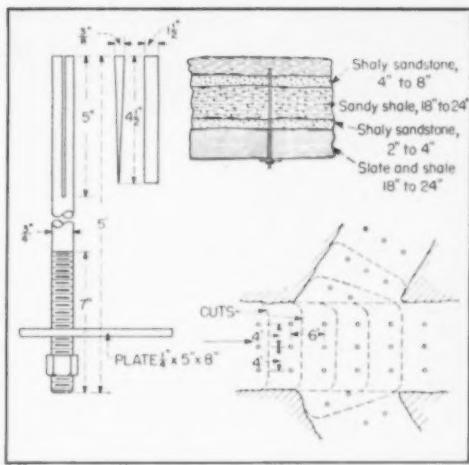
Sewickley seams at two mines of the Christopher Coal Co., Monongalia County, West Virginia. Successful experience points to their

wide use in the future, although not to the extent that crossbars will be entirely eliminated. Bolts  $\frac{5}{8}$  and  $\frac{3}{4}$  in in diameter have been used successfully and no bolts have been pulled in two. Vertical drilling has been found preferable to slanting the holes, with no apparent advantage gained by placing the bolt anchorages out over the coal rib.

In Booth No. 6 mine, in the Pittsburgh seam, a 4-ft stratum consisting of head coal, drawslate and wild coal is very difficult to hold



HOW ROOF BOLTS are used to supplement crossbars at shuttle-car intersections in Booth No. 6 mine.



LARGER ROOF BOLTS with wedges are used at shuttle-car intersections to replace bars in Brock No. 4 mine.



TWO-MAN CREW, using an electric coal drill, installs 20 or more roof bolts per shift in Booth No. 6.



H. W. RALEY, section foreman, points to bolts replacing bars in Brock No. 4. Cutter approaching intersection (left) was stopped.

with wooden crossbars and posts, especially at the intersections, which must be 18x18 ft or greater to accommodate the shuttle cars. With timbering consisting of two 6x8-inx18-ft wooden king bars or two 6-in I-beams supporting four wooden crossbars, falls of the 4-ft of top material averaged two in every eight intersections. At the time this article was prepared, 55 of these intersections had been given additional support consisting of six roof belts put in at the same time the crossbars were placed, and falls had occurred in only three.

The bolts are  $5\frac{1}{2}$ -in in diameter and are  $5\frac{1}{2}$ -ft long. The anchorage consists of an Ohio Brass Type

A-1 6-in shell and plug designed for suspending trolley hangers. The drillers are instructed to extend the vertical holes 12 in into the "black rock," which is a strong and generally reliable stratum lying immediately above the 4 ft of weak material.

Two 3x5x18-in pieces of wood, one placed on each side of the bolt, serve as a cap piece. The washer between the nut and cap piece is a steel plate  $\frac{1}{4}$ x5x8 in. Standard U. S. threads are used in the  $5\frac{1}{2}$ -in bolts. The six bolts in an intersection are spaced on 6- and 8-ft centers.

In one of the three failures the expansion shells pulled out of the

black rock. Examination of the shells indicated that the hole had been drilled too large and that the tapered plug had been pulled to the bottom of the slotted section of the shell. There was some difficulty at first in obtaining drill bits of the proper size.

A crew of two men, using a Jeffrey A-7 hand-held electric coal drill, drill the vertical holes and install the rods at the rate of 20 or more per shift. For drilling the 4 ft of weak material they use a  $2\frac{1}{4}$ -in Sulmet bit on a  $1\frac{1}{8}$ -in auger. Then they employ a  $1\frac{1}{4}$ -in Kennametal bit on a solid rod to drill 12 in into the black rock. An auger extension is used to reduce the



R. A. MAURER demonstrates drill tripod used in Brock No. 4 and inspired by *Coal Age* article. Drill was outside for repairs.



DRILL TRIPOD, mounted on rubber tires and including hand winch, shown folded and being moved in Brock No. 4.

height the drill must be raised. Total cost of the materials for one hole, including the rod, nut, expansion shell, cap piece and washer, is approximately \$1.

#### Stronger Shells Available

Although the Type A-1 expansion shells have been satisfactory when applied in holes of the correct size, the Ohio Brass Co. recently has made available a slightly stronger  $1\frac{1}{4}$ -in shell with a longer threaded plug. At the time this article was written, the new-type shell had not been used in the two Christopher Coal Co. mines.

In the second intersection fall, pieces of the black rock with slicken-sided inclined partings in them were brought down by the bolts. This experience indicated that the bolts actually carry the weight of the weak rock, rather than acting to bind the strata together to form a thicker beam.

In the third failure, the two holes at one side of the intersection had not been drilled deep enough, and the expansion shells were bedded in the drawslide instead of in the black rock. The top material fell on that half of the intersection while on the other side the material pulled loose and hung on the bolts until taken down.

In one section where mining has been completed, some of the crossbars in a few intersections have been taken down, leaving the bolts to support the roof alone. The roof has stayed in place in these cases,

indicating that the crossbars had played little or no part in the support. However, by bending they do serve as a warning that the roof is hanging heavily on the bolts. Although the miners have shown remarkable confidence in the bolts, the practice, for the most part, is to continue installing both crossbars and bolts.

In one area of solid work where two crossbars are set per 8-ft cut, a row of bolts down the center of the heading, consisting of one bolt between each crossbar, is being tested.

Bolts are being depended upon entirely to hold  $3\frac{1}{2}$  to 4 ft of weak top in a section of Brock No. 4 mine, in the Sewickley seam. The bolts used measure  $\frac{3}{4}$ -in x 5 ft and are split 5 in at the top to accommodate an expanding wedge. They are seated by driving them up over the wedge, which backs against the top end of the hole. The  $\frac{1}{4}$ -in x 5x8-in washer contacts the rock directly and no wooden cap pieces are used. Places are driven 16 ft wide with intersections at 60 deg, so that the open space at an intersection is roughly 16x20 ft. Bolts are placed on centers of 4 and 6 ft. Twenty-five shuttle-car intersections had been bolted to the date of this report and, in every instance, the top had been held successfully. Crossbars still are installed as a general rule in the openings to the intersections. Holes are drilled with electric percussion hammers, but the type purchased has not proved sufficiently sturdy to operate for

long periods without careful maintenance.

After reading in *Coal Age* (March, 1949, p 110) a description of a low-coal drill tripod built and used by the Amherst Coal Co., R. A. Maurer, production engineer, Christopher Coal Co., designed a somewhat similar tripod for the electric hammer used in vertical drilling for the bolts. Following the principle of the rope winch for raising the drill, he added rubber-tired wheels and a pair of handles for tramping.

#### Cutters Stopped at Intersections

The roof in this Sewickley-seam mine often develops cutters, which travel relentlessly and have always caused the roof to fall if they hit an intersection area, in spite of a normal complement of crossbars. It is significant that cutters coming from two directions have stopped at an intersection protected by the bolts and that the roof stayed up.

F. R. Zachar, general superintendent, Christopher Coal Co., reports that light steel bars with holes in them for bolts set at angles have been tried but were found to offer no advantage over the present practice of vertical bolts with a small washer or cap piece. Bolts placed close to the ribs seem to be of little value at these operations. The trouble starts near the center of an area and once a considerable sag has developed the lever action of the roof material bends and/or elongates the bolts close to the rib.

# Planning Supervisory Pensions

**Major Types of Pension Plans and What They Provide in Way of Benefits—Conditions to Be Considered in Developing a Pension Plan—Costs and What They Involve—Major Financing Methods and Their Comparative Features**

By G. N. CALVERT

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WITH THE ADVENT of pensions for miners, the question of pensions for administrative personnel has come more to the front in the coal-mining industry. It is not the purpose of this article to advocate or discourage the adoption of plans for administrative personnel but rather to review briefly some of the main points needing attention where the adoption of a plan is under active consideration.

Briefly, properly setting up a pension plan always involves these considerations:

1. The benefits to be provided.
2. Conditions to be attached thereto.
3. The costs.
4. The methods of financing or funding the benefits decided upon.

Though these are interrelated, we shall deal with them in turn.

## BENEFITS

The principal benefit is of course the pension itself, and the major problem is to lay down a formula

for calculating the amount in individual cases.

In practically every instance, the formula adopted gives due recognition to both:

1. Length of service.

2. The level of earnings while in active employment.

Some plans base the pension on total earnings during active service by means of a formula similar to the following:

Annual pension at retirement equals 1% of all earnings prior to the adoption of the plan (or 1% multiplied by years of past service times annual earnings at the time of adoption of the plan), plus 1½% of all earnings after adoption of the plan.

Other plans base the pension on the average earnings during the last few years of service, the formula taking somewhat the following shape:

Annual pension at retirement equals 1% multiplied by the number of years of past service prior to the adoption of the plan, plus 1½% multiplied by the number of

years of service after adoption of the plan, all multiplied by the average earnings over the final five (or 10) years of active service.

A simpler version of this type of formula is:

Annual pension at retirement equals, for each year of active service, one-sixtieth (or one-eightieth, etc.) of the average earnings over the last five years of service.

There are, of course, many variations and refinements in the choice of a formula. In police and firemen's funds, for example, one finds pensions increasing rapidly to a maximum at early retirement age, when the member is no longer fit for hazardous duties, thereafter not increasing or increasing very slowly. In high-salaried groups, one meets the problem of maximum limits of salary ranking for pensions and, with low-paid or short-service groups, the provision of minimum pensions.

Often, and indeed in all industrial plans, there is the problem of integration with Social-Security pensions. This can be dealt with in several ways or, as occasionally happens, not dealt with at all. The more common approach to this problem is to "step" the pension-benefit formula to give recognition to the fact that a part of the pension, tied to the first \$3,000 of earnings, is already provided for under the federal plan. A typical pension formula under such circumstances is:

*A. For service prior to the adoption of the plan: ¾% of the first \$3,000 of earnings in each year, plus 1% of excess earnings.*

*B. For service after adoption of the plan: 1¼% of the first \$3,000 of each year's earnings, plus 1¼% of the excess.*

Since the Social-Security base may change from \$3,000 to some higher figure, the formula sometimes specifies "earnings up to the Social-Security maximum currently in effect." Or the problem is met by adopting a more generous pension formula which has no reference to Social Security and then specifying that the pension so calculated shall be reduced by the Social-Security pension actually payable (or half thereof).

At times one encounters the view that rather than complicate the benefit formula this way it is pref-

## Pension Formulas Vary in Benefits, Conditions and Costs

erable to adopt a modest formula that has no reference to Social Security and provide the resulting pensions quite independently. Again, "steps" sometimes are provided in the rate at which various salary classes rank for pensions, regardless of Social Security.

It will be seen that there is great scope for variety in designing the pension formula and therefore need for careful thought in selecting the formula to be adopted in any particular instance—especially since this is the most important element in the cost of the plan.

In addition to the types of benefit formulas previously discussed, there is a system of indirectly determining the benefits by first fixing the payments to be applied as single premiums each year. This system, known as the "money-purchase" system, is at present passing out of favor—on merit.

Apart from the pension-benefit formula itself, there is the question of ancillary benefits such as disability pensions, death benefits (other than a return of the employee's contribution, if any), widow's or orphan's benefits, early-retirement pensions and optional forms of payment of the principal benefit.

Much scope for variety exists in dealing with each of these items. Typical problems are:

The relation between a disability pension and sick-leave policy, workmen's compensation, group-hospital or any other benefits independently provided.

Whether the disability pension should be graded according to length of service, salary, etc., independently of the accumulation of normal retirement pension credits.

Whether any minimum disability pension should apply.

Whether there should be any length of time during which the benefit is payable.

Whether members should be subject to a medical examination before disability is provided.

What steps should be taken to supervise disability claims once they have arisen.

How the disability pension grades into any early retirement pension available to healthy members.

Here is scope for variety indeed and, with this, need for care in picking the path to be followed. Similarly, each of the other ancil-

lary benefits bristles with possibilities, not to mention pitfalls.

### CONDITIONS

Principal among the conditions that will need to be provided for in a carefully drawn plan are:

**Eligibility**—Should employees enter the plan at once, regardless of age, length of service, earnings or sex? Should they be required to first serve 1, 2, 3 or 5 years? Should they be required to have attained an age of 18, 21, 25 or 30 years? Should they be excluded if they have attained 50, 60 or some other age? Should men and women be treated differently? Should future employees enter the plan as a condition of employment? These are only some of the questions.

**Service Breaks**—Should all past and future service count for pension purposes? Should a break of six months, one year or two years automatically terminate membership or cancel prior past service? Should lay-off, approved leave or military service rank differently? Should pension credits be given during such periods or should membership status merely be preserved? If credits are given, on what basis? Should regular part-time employees be admitted to the plan?

**Past Service**—Should past service rank differently from future service with respect to any of the previous points? For example, though membership may not begin until age 25, should past service credits be extended back to the actual beginning date? In the case of members with long past service at the outset, should past service credits begin only at some later age, such as 30? Or should there be some limit, such as 10 or 15 years, to the period of past service that may be credited?

**Retirement Age**—Should this be compulsory at a fixed age, such as 65, or should it be somewhat flexible, such as optional after age 62 and 35 years of service, becoming compulsory at 65, subject, however, to special discretionary power to permit postponement in individual cases, but never beyond 70? What should be the minimum permissible retirement age, subject to reduction in pension credits? Should a minimum of 5 or 10 years of service be required for over-age members (if any) at the outset?

**Earnings Basis**—Should earn-

ings ranking for pension purposes include bonus, overtime pay or other extras, or should the limit be the base pay rate? If the latter, should it be the base pay actually earned in the year or the annual rate in effect on a given date in the year? This last question bears on the problem of unpaid absences from work and on salary increases during the year, as well as on accounting simplification. It should be noted that Social Security is calculated on gross earnings—a fact that needs consideration where the benefits are integrated with Social Security.

**Member Contributions**—Should membership in the plan be conditional on each employee contributing toward the cost of his benefits? This is a very two-sided question. If contributions are provided for, should they be stepped or graded according to salary to recognize any integration of the benefits with Social Security, the existence of limits to the salary ranking for benefit, etc., etc.? Should they be a level percentage regardless of entry age?

**Maximums and Minimums**—Though these have been touched upon elsewhere in this article, it may be well to note that either or both may be applied to:

1. Age of eligibility for future membership.
2. Past service credits.
3. Total service credits.
4. Earnings ranking for benefit.
5. Earnings ranking for employee contribution.
6. Pensions.
7. Other benefits.

In place of maximum provisions, substitution of more gradual rates of increase after a certain point may be preferred in certain instances. In some circumstances, the provision of minimum benefits may be very costly; in others, scarcely an item of cost at all. Each provision needs careful analysis in relation to the particular plan contemplated.

**Vesting and Benefits Upon Termination of Employment**—Should a terminating member be entitled to anything more than a refund of his own contributions, if any? With interest? If he has contributed to the plan or served his employer for 10 (or 15 or 20) years, should his accrued pension rights be preserved until he reaches age 65? Regard-

less of his age when he terminates? If vesting of accrued pension credits at some point is granted, should this occur all at once or proceed gradually after an initial period of service or contributory service, etc.? How do these termination provisions compare with the death or disability benefits?

## COSTS

Formulation of the plan and study of the possible costs usually go along side by side. The plan is first roughed out on a tentative basis and costs are calculated. Then the refining process begins. Working within given limits of cost, one benefit is weighed against another and one condition against another until the most desirable plan is evolved. Sometimes the over-all cost allowances must be increased to attain some objective in the benefit plan which is especially desired or to include some class of employees. Sometimes, on the other hand, past service or other allowances must be cut to make way for the achievement of such goals.

In speaking of costs, it is necessary to use care in defining the meaning of this term. Many an employer has been induced to install a pension plan only to find that within a few years the annual maintenance cost has risen far beyond his expectations and, at times, his means. Other employers, using a different financing plan, have been pleasantly surprised to find their costs reduced after a year or so even though the number of employees has grown, while others have retained a large measure of discretion as to their payments toward the plan.

The point to notice is that the same initial cost may have very different results where different methods of financing or funding are employed. Furthermore, the first-year cost may be completely upset after a few years simply by changes in the number included in the plan, in the general level of earnings or in other directions.

Where plans are financed through trustee administration, it is most important to consider the mortality and interest bases used in the cost calculations, and the allowances, if any, for future salary increases and terminations. Thus, the use of the Combined Annuity Table or, more especially, this table in conjunction with the C.S.O. table is definitely less conservative. In other words, it throws up a lower estimate of cost than the 1937 Standard An-

nuity Table. Similarly, an increase of 1% in the interest rate used will reduce the estimated costs by about one-eighth to one-tenth.

These reductions in estimated cost do not mean that the pension plan actually will cost any less. Nor does the use of a "conservative" basis mean that the plan will cost any more in the long run. The actual cost will be determined by how long the pensioners live, what interest rate the trust fund actually earns, what earnings changes occur, whether the membership expands and what proportion of the employees actually terminate in one way or another before they retire, plus, of course, the design of the benefit program.

The use of a conservative basis for estimating cost merely results in the employer paying more at first and less in later years, and vice versa. In a trusted plan, such "shifting through time" of the impact of the cost of the plan may be readily achieved in other ways much more preferable to the use of a weak actuarial basis in cost calculations.

In an insured plan, the cost may or may not be subject to "experience refunds" in future years. If so, the premiums are gross payments, calculated on a conservative basis. As the years go by, excess earnings or other gains from favorable experience are credited against future premium payments so that, in the absence of adverse features leading to increased costs, such as low interest yields or increase in numbers or average age, the net payments in future years will be reduced.

Suffice to say, great care is necessary before entering into either a trusted or an insured plan. Special care is necessary before entering into a plan involving separate policies on individual lives, or non-profit policies in any form. Disinterested expert advice, while perhaps apparently less essential in an insured as compared to a trusted plan, actually can yield even greater returns to the employer, who can, if he is not careful, find himself quickly inundated by insurance agents without being in position to penetrate behind the persuasive arguments with which he will be deluged.

In looking at cost figures, it is necessary to have not only an estimate of the *initial* annual cost but also the best possible projection of the *future* annual cost, looking quite a few years ahead, on the basis of reasonable allowances for

future inflow into the group, earnings, terminations, dividends and whatever other factors apply in the particular case.

Such forecasts, while seldom very reliable, can often reveal very striking and important features not brought out in the first-year cost estimates, such as increases resulting from large inflows from the group actually employed but not eligible at the outset of the plan, or the method of assessing the costs, or, on the other hand, large decreases from completion of funding of "past" costs, expected increases in dividends, and so on.

Finally, as a guide to the statistical work that should be done in presenting costs, it may be added that these present and future or ultimate costs should be expressed as percentages of (a) the aggregate payroll, (b) the salaried payroll in the case of a salaried plan, (c) the eligible salaried payroll, (d) gross sales and (e) production costs per unit. Comparisons (f) with the cost of other employee benefit provisions now in force or contemplated, (g) between various subgroups included in the plan and (h) between the initial and ultimate cost borne by the employer and employees, respectively—in the case of a contributory plan—also are desirable.

Only when the costs of the plan have been looked at from all these angles can it be said that they have been thoroughly considered.

## FUNDING METHODS

There are many ways of funding, or financing, a pension plan, some better than others and some more suitable in particular instances.

A broad though somewhat unreal line of demarcation is sometimes drawn between the so-called "insured" and the "trusted," or "self-administered," plans. The reason why this division is unreal is that one often finds trustees, on the one hand, buying annuities, at time of retirement, from insurance companies, or holding individual policies in behalf of members or groups of members, and, on the other hand, insurance companies acting as trustees under "deposit-administration" plans or exercising the functions of trustees in connection with participating-group annuity contracts. Likewise, one finds a variegated group of "combination" plans in which the functions of life insurance and trusted pension plans assume all manner of shapes and sometimes hideous entanglements

—not infrequently as a result of the intertwining of the personal interests of the so-called pension-planner with the genuine merits of the case.

Perhaps more important than whether an insurance firm or a trust company invests the funds and pays the pensions is the question of *how* the funding is arranged, i.e.:

**1. Through the "normal-and-supplemental" method**—available only with trustee or deposit administration.

**2. Through "single premiums,"** a common method with group-annuity contracts.

**3. Through "level premiums,"** often less suitable than the "normal-and-supplemental" method for trustee plans and less popular with the insurance companies than the "single-premium" system, but nevertheless not without its particular merits.

**4. Through a "level percentage of payroll"** with or without supplementary payments.

"Money-purchase" benefits, by definition, always are funded by single premiums.

Each of the preceding systems theoretically can be applied to both "past" and "future" service benefits combined, or to "future" benefits only, with separate arrangements being made for past-service liability. In practice, the normal-and-supplemental method embraces both past and future service benefits, while the single- and annual-premium methods require separate funding of past-service costs.

Where life insurance in the form of whole-life individual policies is wrapped up with the pension plan, the cash values of the policies can be converted into pensions at retirement age, the remainder of the pension payments being funded in any one of the preceding ways.

To add spice to the variety, some plans provide that members may individually purchase extra pensions or insurance, or both, while others combine profit-sharing with pensions, thus adding an indefinite and unpredictable extra in one form or another at retirement. At times, the funding of these extras follows the general pattern of the plan; at others, it does not. Still other plans combine the fossils of old, discarded group-annuity contracts with new trustee or combination plans, with or without the preceding extras, giving the whole field the appearance of something of a wilderness

rather than a cleanly assorted array of types.

To enter into all the features of even the major funding methods would take more space than is reasonable here. It is perhaps enough to point out the following:

**1. The "normal-and-supplemental" method** provides the maximum degree of flexibility and discretion to the employer in timing his payments into the pension fund and enables him to fund the maximum proportion of the cost in the early years.

**2. The "single-premium" system** goes farthest in preserving the relation between pension units credited up to any one date and pension units actually paid for.

**3. The "level-premium" plan** enables paying more for pension in earlier years than the single-premium system, though its administration through an insurance contract is more trouble to the insurance company.

**4. The "level percentage of payroll,"** as used in connection with some trustee plans, provides the smoothest percentage of labor costs over a period of time, though it is less preferable, in some respects, than the normal-and-supplemental method, which involves the smallest positive annual cost commitment while permitting the largest proportion of the funding to be done in good years.

Plans financed through insurance contracts, other than deposit-administration contracts, often take discretion in timing payments away from the employer and, from the employee's point of view, sometimes are preferred for that reason. From the employer's point of view, there is more rigidity in the commitment; from the employee's, more security, though this may be defeated if the element of rigidity causes ultimate discontinuation of the plan. Since pension plans involve employee relations, the security argument is especially strong with small and less stable companies.

Among the other special aspects of funding may be noted the question of how big the group should be before it can safely embark on so-called self-administration or trustee administration — another problem about which a great deal of undigested thinking has become current, in print and otherwise.

The size of the group is only one factor of several that should determine this question. For example, a small group of supervisors attached

to a large group of workers may enter into a trustee plan with much greater safety than a somewhat larger group, supervisory and otherwise, completely covered by the plan. Any fluctuations in cost as a result of variations in the experience of the first-mentioned small group will be negligible over a period of time in relation to the payroll for the entire group, including workers.

When properly funded, pension plans are quite stable in themselves. Variations in interest or mortality do not throw sudden burdens on employers that have to be adjusted in the same year. Deficiencies arising in one year or period usually can be taken care of by additional payments spread over a decade or more if desired. Prompt detection of any adverse trend and equally prompt adoption of suitable remedies are the important things. It is better to fund early and create a surplus and earn on it than to have to catch up to a deficiency plus future interest thereon.

Stability that may be lacking where one small employer is involved can sometimes be achieved through the pooling of plans by several employers in the same industry—an idea that has worked in one area in the coal industry.

The question of whether to insure or trustee the plan has, of course, many aspects and, like all phases of pension planning, needs careful and disinterested consideration in each case.

Beware, above all things, in the preliminary stages of considering this question, of the consultant, whether independent actuary, so-called "pension-planner" or insurance "expert," who can see only one side of the question or whose fee or commission will be forthcoming only if one or another type of plan is adopted. The arguments, pro and con, can be framed most persuasively from both angles and the balance of advantage shifted either way through many a subtle device.

At the same time, expert advice in the framing of the plan is clearly necessary and, in the interests of economy in executive time, the earlier it is obtained the better. If no other course is available, it is better to call in experts from both camps and decide after hearing both sides of the question advocated than to decide on the basis of one side only. There are a few much-needed organizations equipped to furnish both kinds of advice.

# EXIDE-IRONCLAD BATTERIES ARE DIFFERENT!

Specially designed to provide dependable power for  
MINE LOCOMOTIVES, SHUTTLE CARS, TRAMMERS

Storage batteries are called upon to perform many tasks. No single type of battery is adequately suited to all. To meet these numerous requirements, Exide engineers have developed special types, to fit each application. Among these several types is the specially designed Exide-Ironclad Battery. Details shown below.



#### DESIGNED FOR STATIONARY USE

The Exide-Manchex Battery has the manchester type positive plate with the lead button construction. Specially designed for stationary use in many classes of industry.

#### DESIGNED FOR AUTOMOBILE USE

The Exide Automobile Battery has plates of staggered grid construction. Specially designed for use in automobiles, trucks, buses, aircraft and numerous other applications.

#### DIFFERENT IN DESIGN DIFFERENT IN CONSTRUCTION DIFFERENT IN SERVICE QUALITIES

Chief among these differences is the unique positive plate, an exclusive Exide feature.

**EXIDE-IRONCLAD POSITIVE PLATE**  
Consists of a series of finely-slotted tubes which contain the active material. So small are these slots that, while permitting easy access of electrolyte, they retard the active material from readily washing out or jarring loose . . . adding considerably to life of plate.

Exide-Ironclad Batteries have ALL FOUR of the characteristics that a storage battery must have to assure maximum performance from mine locomotives, trammers and shuttle cars—high power ability, high electrical efficiency, ruggedness and a long life with minimum maintenance. The combination of these four Exide-Ironclad characteristics assures years of dependable day-in, day-out service.

# SAFE DEPENDABLE POWER



"Exide" and "Exide-Ironclad"  
Reg. Trade-marks U. S. Pat. Off.

1888... DEPENDABLE BATTERIES FOR 61 YEARS... 1949

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto

COAL AGE • September, 1949



## The Foremen's Forum

### How to Use Regulators

#### What Regulators Do and How They Do It—Types of Regulators and Their Characteristics—Installation and Operation of Regulators in the Mine

SPLITTING air currents is probably as old as mining. Nevertheless, it still is of vital concern in good ventilation. In fact, it is increasing in importance not only from the cost standpoint but because increased stress on better ventilation for health and explosion reasons is leading to more and more splitting. Now, many mines provide each working section or panel with its own current in insure an ample supply of good fresh air for better working conditions and better dilution and removal of gas.

If splitting is attempted without some form of regulation, the air flowing into each section will be determined by natural forces. Therefore, the chances are that it will be more than desired or not enough. Consequently, regulators must be installed to adjust the volume going into each working territory.

Air flow, in many respects, is governed by much the same laws as water flow. For example, if water is being pumped to a Y with one short and one long leg, both the same size, more water will run out the short leg because, being shorter, it does not offer as much resistance. Therefore, the water can go through it easier and it will put out more. On the other hand, if both legs of the Y are the same length but one was smaller than the other, the bigger one will put out more water because, being bigger, its resistance to flow is less and the water can go through it easier. Finally, if both legs of the Y are the same size and same length, but one is much rougher, or crooked, or partly clogged, the clean straight pipe would carry more water because its resistance to flow is less.

A split ventilating system is like a pipe with a lot of branches of various sizes, lengths and degrees of resistance. If nothing was done, the chances of getting the correct volume of air in the right place would be practically nil. If the problem was

attacked by pumping in more air to build the volume to the section receiving the least up to the desired quantity, it would be necessary to put in more than was needed into the other sections, boosting the power requirements and wasting money. Splitting, therefore can actually save money by insuring good ventilation with a

minimum amount of air input needed.

Regulation therefore is a necessary supplement to splitting. Devices commonly employed are:

1. Box regulator, an opening in a stopping with or without a sliding door or other means of adjusting size and in turn volume of air passing through the opening. This type provides the most precise control over air volume.

2. "Half-brattice," "half-door" or "partial-brattice" regulators, consisting of a stopping, brattice or curtain partway across the airway. Precise regulation of air volume is difficult, along with adjustment to change air



112-YEAR-OLD PICTURE shows a man . . .

#### Running Away From Security

The picture above shows a man running away from security.

He received all his meals for himself and family for nothing.

He received free medical attention for himself and family.

He paid no rent.

He and his family received free clothing.

His house was furnished for him.

He got his working tools for nothing.

If anything happened to him, his family received the same benefits that were furnished them when he was alive.

If it was necessary for him or his family to travel, transportation was furnished.

He didn't have to pay any taxes.

In fact, he didn't have to pay for anything. He didn't even need to have any money.

Yet, he is RUNNING AWAY.

You know the answer. The picture, taken from an old newspaper, shows a slave running away from all the blessings mentioned above. That slave and a lot of others preferred freedom and insecurity to slavery and security.

Why do we bring this up?

Because we, as individuals, are sacrificing our freedom to become slaves. For every benefit we gain, we have to pay a price. That price is part of our freedom.

Compare our lot with that of our ancestors, the pioneers. With little more than their two hands, they won a living from the wilderness. But they had freedom and what they earned was their own. They supported themselves but not their masters.

A slave has to support himself and his master.

—Adapted from *The Safety Commentator*, The Hudson Coal Co., Scranton, Pa.



## This B. F. Goodrich mining team helps cut inventory, helps cut costs!

**N**OW, B. F. Goodrich offers two special tires for coal mining operations... the Universal and Rock Logger Silvertowns.

The Universal (shown above at left) should be used wherever traction is a problem. Note the heavy, wedge-shaped cleats that dig in and pull, regardless of load, grade or direction.

The Universal tread is specially compounded against cutting by sharp rocks, shale or coal. In addition, the bulky cleats protect the tire's undertread against cutting.

The B. F. Goodrich Rock Logger is also for rugged service, but is used for longer hauls or part hauls on well-maintained roads and highways. The Rock Logger's specialty is long, even tread wear. Like the Universal, the Rock Logger's tread is specially compounded for cut resistance. The Rock Logger is

ideal for front wheels even though greater traction tires must be used on drive wheels.

Both tires have non-directional treads so may be mounted in any wheel position — fewer spares are needed!

### Built with NYLON Shock Shield

Both tires have the famous B. F. Goodrich nylon shock shield built in between the tread rubber and the all-rayon cord body. The strong, elastic nylon cord absorbs and distributes impact, shields the rayon cord body from shock.

Only BFG gives you the added protection of nylon shock shield — the added savings through (1) longer life (2) increased bruise resistance (3) less danger of tread separation (4) more recyclable tires.

Also, both tires are available with

all-nylon construction in sizes 11.00 and larger at extra cost.

Find out now how B. F. Goodrich Silvertowns can help you cut your operating costs. There's a BFG tire for every need, every job. Get in touch with your B. F. Goodrich Dealer or write us direct. *The B. F. Goodrich Company, Akron, Ohio.*



## It's Awfully Easy to Forget

That the top is as dangerous now as it was the first day you went into the mine.

That the motor you are running today is as dangerous as it was the first day you climbed into the deck.

That more men are killed in the mines after they reach 40 than before that age.

That more men are killed after they have gained 20 years of experience than before.

That the odds are against you the more you change from mine to mine.

That 85 out of every 100 accidents are caused by bad practices.

That 13 out of every 100 accidents are caused by bad conditions.

That ONLY 2 out of every 100 accidents are unavoidable.

That most instructions the boss gives are for your own or another's safety.

That, after all, it's up to you to prevent accidents.

Yes, it's awfully easy for a careless man to forget, but the SAFE man remembers.

—Safety News Letter, Eastern Gas & Fuel Associates.

volume if and when it becomes necessary.

3. Door regulator. As its name indicates, this regulator is a door hung at a corner where the air is split and swung into the current to cut it like a knife. It permits of precise regulation and has the further advantage of not increasing the natural pressure of the split. Rather, it divides the airway in proportion to the work done in the respective splits. Compared to the box regulator, it can save considerable power. In an example given in the "Coal Miners' Pocketbook," regulating four splits with door regulators resulted in a power requirement of 212.4 hp, against 307.7 hp with box regulators.

But while it has advantages from the power-saving standpoint, the door regulator offers practical installation difficulties because it must be used at the beginning of the split. Since the rule is that haulage must be on the intake, the only place the door regulator normally can be placed is at the track junction—an impossibility in normal mining because of interference with the movement of cars. Consequently, it usually is necessary to use other forms of regulators, of which the box type is the most satisfactory.

Since mine airways seldom are the same in length or resistance, there generally is always at least one that offers the highest resistance to air passage. Other lower-resistance airways therefore get the greater proportion of the air—in fact, often much more than they need, while the higher-resistance opening or openings get less. The answer is to increase the resistance of those airways needing less air to force more through the others.

The regulator provides the increased resistance. Its practical effect is to raise the resistance of the split in which it is used to that of the "free"

split—usually the longest or the highest-resistance for some other reason. With the resistance equalized or nearly equalized, it then is possible to control the division of the air as desired.

Because resistance is added, it might be thought that the net result is an increase in ventilating horsepower. In most cases, however, this is not true because, compared to putting all the air all the way through the mine, splitting reduces power requirements, aside from the fact that continuous-current ventilation normally is not permitted or is undesirable from the safety standpoint.

Since, as previously pointed out, regulation involves building the resistance of the regulated splits up to that of the free split, it becomes obvious that the higher the resistance of the free split the higher the power requirements for ventilation. Therefore, regulation highlights the importance of keeping airways, and particularly the free-split airway, ample in size, straight and clean. There is no better way of saving money around a mine.

Practically, assuming that the fan is properly designed to circulate the required air volume against the maximum mine resistance, regulation is a matter of putting in regulators where observation indicates that they are necessary and then adjusting them to provide the desired air volumes. The regulator need not be a fancy, expensive device, but there are a few basic rules to be observed in its installation and use.

1. The regulator, to the maximum extent possible, should be made of an incombustible material.

2. It should be located where it is both easy to get at and yet is out of the way. Normally, the best place to locate a regulator of the type generally used is on the return side of the split. In fact, location on the intake

usually is impractical or impossible, especially with track haulage.

3. The roof and ribs should be sound and solid where the regulator is placed.

4. The entry on the delivery side should be straight for at least 50 ft. Otherwise, the regulator is likely to behave erratically.

5. The regulator opening, in addition to being large enough to pass the required volume of air, also should be large enough for a man to get through. Usual size is  $2\frac{1}{2} \times 2\frac{1}{2}$  ft.

6. A means of adjusting the size of opening should be provided. A practical one is a sliding door. Markings on the frame facilitate restoring the slide to proper position in case it is moved.

7. Regulators should be checked regularly to make sure that the setting has not been changed and also to make new settings when changes in mine or split conditions necessitate changes in the resistance necessary for proper proportioning of the air. When a major change is made at one location, it normally requires changes at others.

## A Section Foreman Looks at Safety

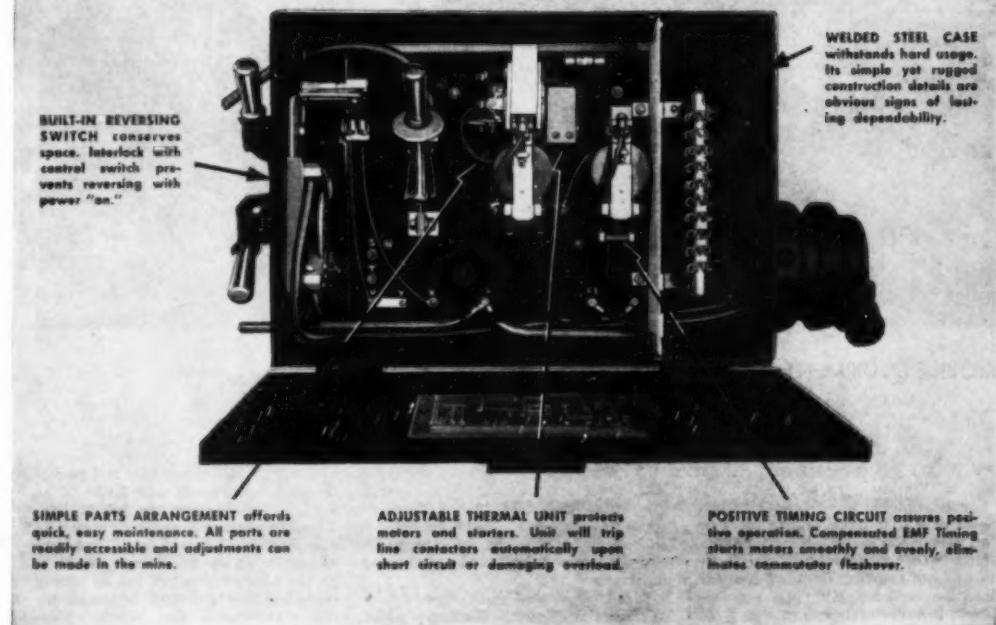
"It takes the same caliber of foreman to lead his men into a good safety record as it does to lead them into a high production record. He must be able to command the confidence and respect of his men, and, in order to do this, he must keep the following fundamentals in mind:

1. He must be fair and impartial (show no favoritism).
2. He must give clear and complete instructions.
3. He must show a sincere effort to appreciate the employees' points of view.
4. He must instruct his men as to safe work habits and do so in a manner which will make his men realize that he is sincerely interested in their safety and well-being.

"It frequently happens that increased productivity accompanies a well executed safety program. Why? It seems that, when physical hazards have been removed and when the employee knows he is habitually doing his work safely, his mind is relieved of fear and he is free to devote his thought and energy towards performing his work more efficiently—and, incidentally, with less nervous exertion. It is certainly in the cards for us to attain a good safety record. A great share of both the initial and day-to-day responsibilities for the success of such a program lies with us who are in management."

—Michael R. Jane, section foreman, Willow Grove No. 10 mine, Hanna Coal Co., St. Clairsville, Ohio, in a talk before the All-Ohio Safety Congress.

# More for your money...



BUILT-IN REVERSING SWITCH conserves space. Interlock with control switch prevents reversing with power "on."

ADJUSTABLE THERMAL UNIT protects motors and starters. Unit will trip line contactors automatically upon short circuit or damaging overload.

WELDED STEEL CASE withstands hard usage. Its simple yet rugged construction details are obvious signs of lasting dependability.

POSITIVE TIMING CIRCUIT assures positive operation. Compensated EMF Timing starts motors smoothly and evenly, eliminates commutator flashesover.

## O-B MOTOR STARTERS are built for hard mine usage...

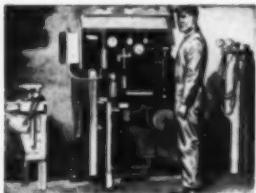
Control equipment dollars go farther when they are invested in O-B Automatic Motor Starters. Not that the initial cost is less . . . but they last longer, require less maintenance and operate with less supervision than other similar equipment. A glance at the case and the inside of the O-B

Starter shown here tells the reasons why . . . You can get the benefit of these dollar-saving advantages by specifying O-B Starters on your next equipment order. They are available for either gas-free or gaseous service.

3015-M

*Ohio Brass*

MANSFIELD, OHIO  
Canadian Ohio Brass Company, Limited  
Niagara Falls, Ontario



## Operating Ideas



MOBILE EQUIPMENT at western Kentucky strip mine helps in . . .

### Streamlining Electricians' Field Work

AN ARMY SURPLUS HALFTRACK and a Fordson tractor, both only slightly modified to serve special purposes at a strip mine, make life easier for field electricians who erect poles, string wire and maintain lines at the two pits of the 20th Century Coal Co., Inc., Beaver Dam, Ky., where Kermit Hurst is superintendent.

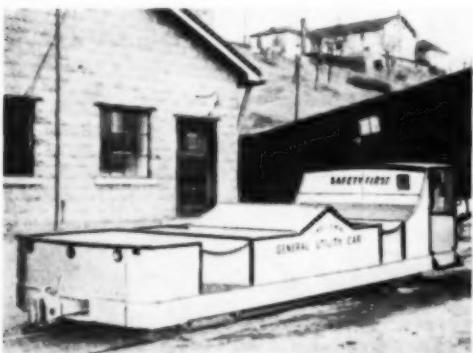
The halftrack, shown above at the left, has been equipped at the front end with a winch, operated by a power

take-off from the halftrack engine, and a demountable A-frame for erecting poles for field lines. Haulage space for cable spools, insulators, skids, tools and other equipment is provided in the bed of the converted halftrack.

The tractor, also shown above with W. W. Powell, 20th Century's chief electrician, at the wheel, is especially useful in the rough hilly terrain where the pits are located. Light and highly

mobile, it climbs steep hills and pushes through underbrush with little or no trouble, thus easing the job of linemen. Also, since it makes it way into places where linemen could not conveniently go on foot, lines need not be run around hills but can be strung on a bee-line and still be accessible for maintenance and repair. Non-rotating spools bolted to the rear of the tractor are used for pulling wires across pole-arms.

### All-Steel Utility Car Gives Snapper a Break



NEW MULTI-PURPOSE CAR has compartments for stowing and hauling equipment and supplies, plus a cab for the trip-rider.

A HOME-DESIGNED and home-built utility car, shown in the accompanying photograph, features an enclosed compartment that provides safety and comfort for the snapper and enables him to keep the trip and the track in view through safety-glass windows looking fore and aft. The car was built in the shop of the Isabella mine, Weirton Coal Co., Weirton, Pa., under the direction of John Novak, outside maintenance foreman.

The snapper's cab is equipped with a hand brake and an alarm gong. A rubber sheet,  $\frac{7}{8}$ -in thick, is vulcanized to the roof of the cab to prevent the trolley wire from contacting the steel top. Of all-steel construction, the car is 6 ft 8 in wide and 18 ft long. It rides on 8 wheels and is equipped with automatic couplers, thus providing smoother, safer riding.

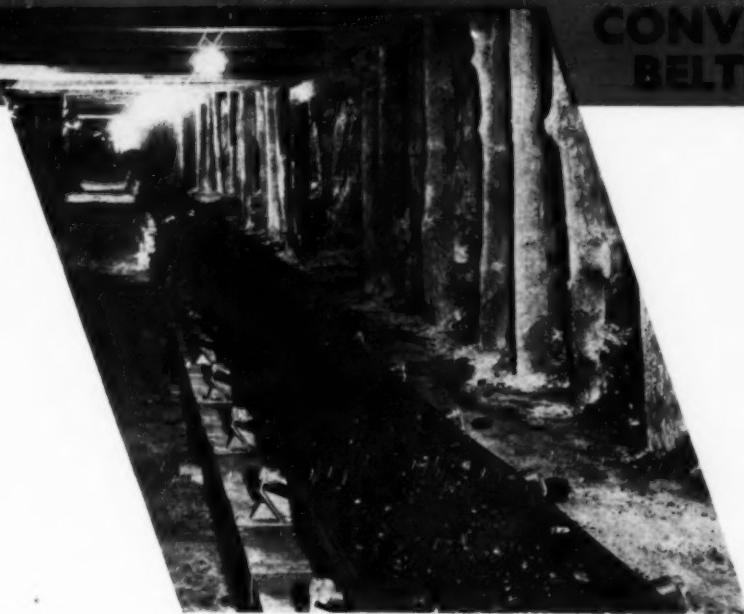
Space is provided for stowing and hauling equipment and supplies as follows: (1) a compartment for hauling 50-gal drums; (2) a compartment for hauling 100-lb grease drums; (3) a 100-gal water tank with 50 ft of 1-in hose, a nozzle and two CO<sub>2</sub> cylinders to provide water pressure; (4) stowage for 3-, 6- and 9-ft coal augers; and (5) a compartment for transporting steel ties and miscellaneous track and trolley supplies.

**FOR DUST, ENCLIMES AND ROLLERATION—SPECIALLY**

**HAMILTON**

# **KING KOAL**

**CONVEYOR  
BELTING**



- KING KOAL belts have the ability to meet the varying requirements of entry, gathering, mainline, slope and preparation of plant installations.
- You don't need to worry about mildew or damp rot.
- You can produce to capacity without fear of belt breakage due to severe impacts and heavy loads.
- In short, KING KOAL belts can, and will, give you uninterrupted, maintenance free performance when the going is tough and loss of time is costly.
- Our claims are based on years of proven performance.
- Why not call in a Hamilton sales engineer to discuss your belt problems and requirements.
- Thorough service and prompt delivery are assured.

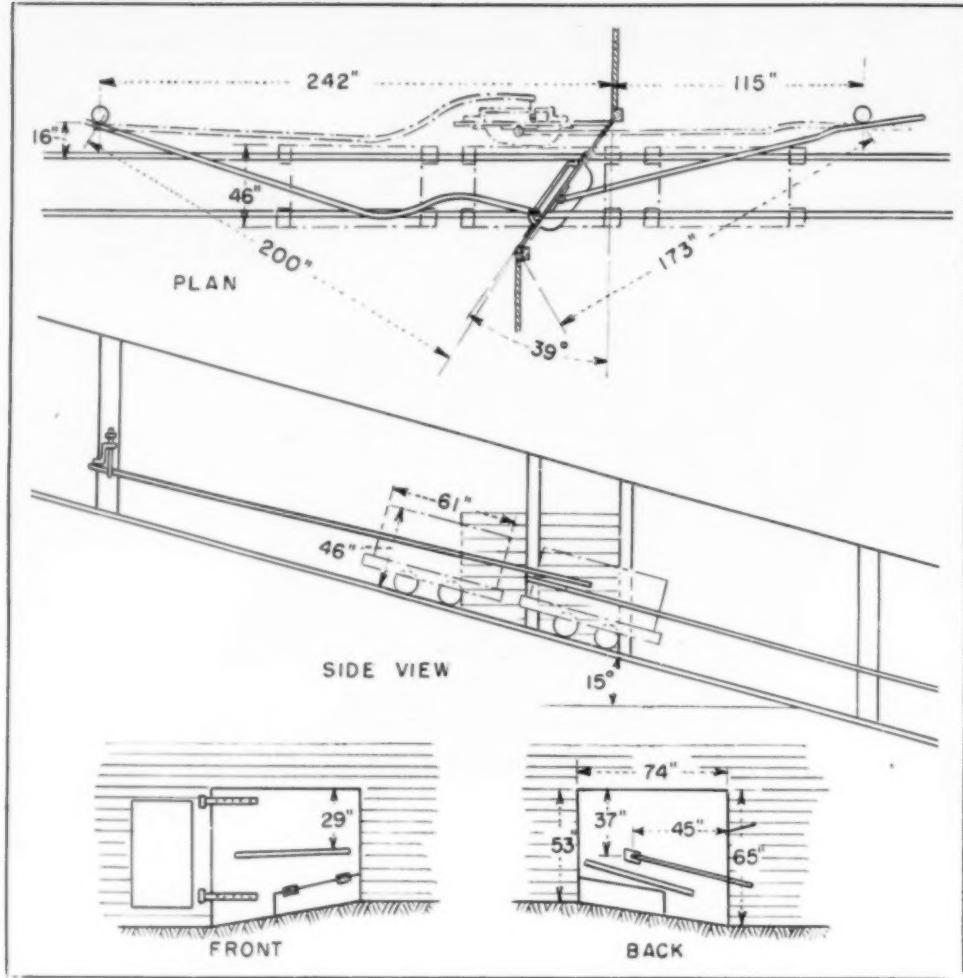
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## Japanese Automatic Mine Door Similar to American Invention

THE DESCRIPTION in *Coal Age* (October, 1948, p. 120) of an automatic mine door invented to L. H. Hawkes, Montgomery, W. Va., and winner of the first prize in the "Gadget Contest" at the 1948 Southern Appalachian Industrial Exhibit, immediately brought to mind a door-opening device seen in a Japanese coal mine, writes Major Charles S. Merriam, scientific consultant, mining and geology division, Natural Resources Section, GHQ, SCAP, APO 500, c/o Postmaster, San Francisco. Although the device is not identical with Mr. Hawkes' invention, "the idea is quite similar and struck me as being quite a coincidence," says Major Merriam, who very kindly went to the trouble

of securing from the mine operator the accompanying drawings illustrating its construction.

The Akai mine where the door is in use is located at the town of Akai, Fukushima Prefecture, Honshu, on the eastern coast of Japan about 120 miles north of Tokyo. The mine is owned by the Nippon Soda Co., Ltd., with main offices in Tokyo. Production for the fiscal year ending March 31, 1948, averaged 5,400 metric tons a month.

The mine opening is a rock slope, inclined about 15 deg. All coal is hauled to the surface through this slope, which also is the intake airway. There are four doors placed about 60 ft apart near the mouth of the slope. A slot cut in the bottom of each

door permits passage of the haulage rope. The first car in each trip, either ascending or descending, contacts one of the large rails shown in the drawing, forcing it over to the side of the track and causing the door to open automatically.

Major Merriam reports that he watched the doors in operation and that the device appeared to work without a hitch. The mine operator stated that no difficulties, such as derailment of cars or damage to the doors, had been experienced since it had been in use. It was not possible to determine the cost of the installation, but since the materials used were reclaimed rail, hinges, bolts, etc., the cost for material was negligible.



This powerful, high-speed locomotive, designed for long gathering-points-to-tipple runs, gets loaded cars out, empties back in, at new time-and-money-saving speeds.

## NEW 30-TON GENERAL ELECTRIC MINE HAULAGE LOCOMOTIVE

# MOVES MOUNTAINS

*Safely*

FOR SAFER SERVICE . . . G-E MINE LOCOMOTIVES

GENERAL  ELECTRIC

If you want to move mountains of coal quickly, inexpensively, and safely, here's the unit for you.

**IT HAS POWER . . .**

up to 18,000 lbs maximum drawbar pull!

**IT HAS SPEED . . .**

up to 35 mph maximum permissible speed!

And it's good sense that a unit which operates with less strain on track and equipment gives maximum assurance against mishap to personnel and equipment.

Here are a few of the safety features of this unit:

**WEIGHT IS DISTRIBUTED** over four axles to reduce concentrated load and lateral force on tracks.

**SHORT, RIGID WHEELBASE**, low inertia, and swivel connections of trucks permit wheels to follow rails freely, without binding or straining.

**SHORT OVERHANG** at ends prevents teetering or galloping, promotes smooth riding. Call in a G-E mine locomotive specialist for detailed discussion of all your haulage problems. Meantime, write for bulletin GEA-4774A. Apparatus Dept., General Electric Company, Schenectady 5, N. Y.

## Safety Rules for Arc-Welding

### Equipment and Welding Circuits

1. Keep welding leads and primary power leads clear of ladders, passageways or doors. Keep leads and cables used for power service to portable welders out of places where machines or trucks may run over them.

2. Repair or replace defective cable immediately. Use insulated cable connectors of the locking-joint type, with a capacity no less than that of the cable. Disconnect power before splicing cable.

3. Do not permit power-supply cable for portable welders to become tangled with welding cables or to be near enough to the welding operation that the insulation can be damaged by sparks or hot metal.

4. Do not weld without all electrical connections, power supply, welding leads, holder and ground clamp being secure and the welding machine frame well grounded. The work clamp must be securely attached to work before any welding is done.

5. Disconnect welding machine from power supply when left unattended.

### Personal Protection

1. Do not strike an arc without first putting on a face shield or helmet protecting the face and eyes. Anyone in the vicinity of the welding arc should be similarly protected.

2. A skullcap should be worn under the helmet.

3. Make sure the face shield or helmet is light-tight and adequately protects the eyes, head, face and neck.

4. When chipping slag, use a chipping hammer or pneumatic chisel and wear goggles. Hold one hand over-

head of the hammer or chisel as a shield to block particles of slag from flying promiscuously.

5. Wear good leather gloves of the gauntlet type. Wet or worn gloves have lost all protective qualities and should not be worn.

6. Wear high-top shoes to prevent weld-spatter burns on the feet and ankles.

7. Weld in a dry place and with dry equipment. Supervisors with authority should approve operation under any other condition.

8. Keep shirt sleeves buttoned and pockets closed to avoid catching weld spatter that could cause burns.

9. Inspect personal protective equipment before beginning to weld.

10. Treat all electrical circuits with the utmost respect. This includes not only the welding machine but portable electric tools, lights, blowers, etc. Do not remove light bulbs without turning off current. Exposing yourself to electric voltage does not develop immunity. Keep dry and use special precautions to insulate the body when clothing is wet from perspiration or other moisture.

11. Weld with a fully insulated electrode holder.

12. Remove electrode stubs from the holder only when the body is not in contact with the work.

13. Do not weld in confined quarters without installing positive ventilation to assure a good current of fresh air.

14. When welding or cutting brass, bronze, galvanized steel, cadmium-coated steel, or metals coated with lead or zinc-bearing paint, either indoors or in open air, make sure not to breathe quantities of the fumes. An individual suction air-line or a

good respirator will provide protection.

15. In laying down or hanging up holders when not in use, put them where they will not come in contact with other workers or other holders.

### Fire Protection

1. Weld only in properly authorized areas.

2. Do not weld without removing combustibles or flammables from the vicinity. If it is impossible to avoid welding in areas where combustible materials are present, as may be necessary in maintenance operations, post a watch for at least 30 min after welding ends to make sure that smoldering fires have not started.

3. Place stub ends of electrodes in metal containers to prevent accidental body burns or fires.

4. Have a fire extinguisher readily available.

5. Any container that has held flammable material should be thoroughly washed out or steamed. Then fill the container with water and drain down to a point just below where the welding is to be done. An opening should be provided to permit steam or air to escape. Welding should not be begun on jobs of this type without permission from the proper supervisor.

6. It is advisable to remove the fuel tank from any motor-driven vehicle before any welding. If this cannot be done, protect the tank and fuel lines adequately from spatter by asbestos board, paper or blankets.

Excerpted from "Arc Welding—Safety Speaking," a paper presented at the National Safety Congress, Oct. 21, 1948, by W. W. Reddie, Welding Department, Westinghouse Electric Corp., Buffalo, N.Y.

## Unit Helps Get Cutter-Bar Rivets Tight the First Time



**PERFECT RESULTS** on every rivet, only one man for the actual riveting instead of two and a quicker and easier job have resulted from the building and use of an air-operated C-clamp for cutter-bar maintenance at the Hickey mine of the Diamond Coal Mining Co., Caryville, Tenn.

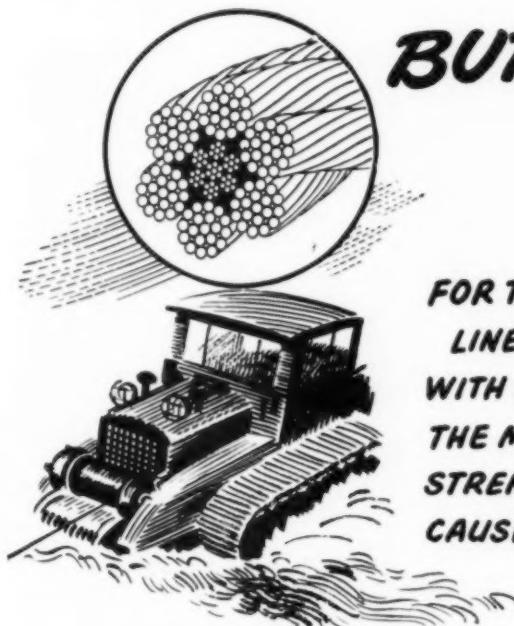
As shown in the photograph, the fixed yoke of the clamp consists of two members spread apart to clear the hole and permit riveting. The 4½-in. air plunger is held against the rivet head with a pressure approaching 1 ton.

### YOUR IDEAS WANTED

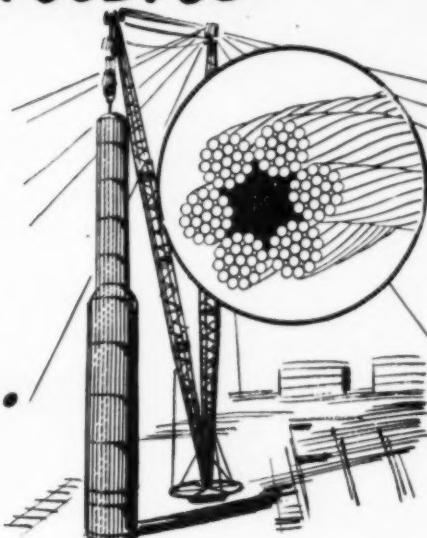
**OPERATING IDEAS** submitted by mining men are welcomed by COAL AGE. In fact, we will pay you, on publication, \$5 or more for each operating, mechanical, electrical or safety idea that has worked for you. So why hold back—write us today!

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WITH HEMP CENTER IS OK FOR  
TACKLE BLOCK FALLS BECAUSE  
IT IS SUFFICIENTLY FLEXIBLE  
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**FOR TRUCK AND TRACTOR WINCH  
LINES U-W 6X19 FILLER WIRE  
WITH I.W.R.C. IS BETTER BECAUSE  
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More Detailed Data  
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Available From  
the Manufacturer

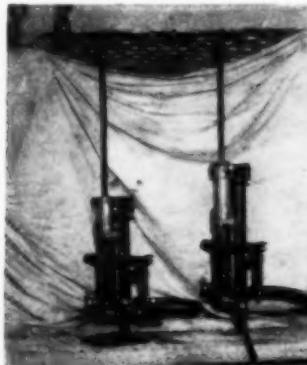
## Equipment News

Air-Feed Sinker	p 116	Pumps	p 114	EQUIPMENT SHORTS—A round-up of equipment and supply items for mining
Altimeter	p 112	Roof-Bolting Stopers	p 110	..... p 120
Clamp Meter	p 118	Shovel-Crane Units	p 118	INDUSTRIAL NOTES—News from the manufacturers
Expansion Shell	p 110	Take Up	p 116	..... p 130
Gasoline Engines	p 116	Tire Benches	p 112	TRADE LITERATURE—Manufacturers' bulletins
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**EXPANSION SHELL AND PLUG FOR ROOF SUPPORT**—New expansion shell and plug for anchoring threaded rods or headed bolts with bearing plates in mine roofs is stated to provide greater expansion with increased holding power than standard expansion shells and plugs, and will develop the full tensile strength of rods as large as  $\frac{3}{4}$  in. Installation of roof support system using O-B's expansion shell and plug is simple and

fast, the company declares, and uniform results can easily be obtained. Folder 858-M gives additional data.—*Ohio Brass Co., Mansfield, Ohio.*

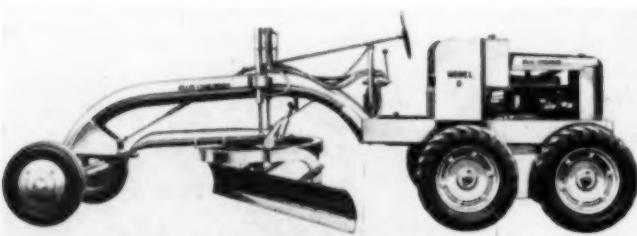


**ROOF-BOLTING STOPERS**—Used both for drilling holes and driving pins, new RP-48 short stopers with either Jackhamer or anvil-block front-heads are equipped with release rotation so that the pins can be driven without turning. The stopers are available with minimum closed length

of  $2\frac{1}{4}$  in., 12-in steel change, using the Jackhamer-type front-head and  $2\frac{1}{2}$  in. with a 16-in steel change, anvil-block front head. Various other longer lengths of feed also are available.—*Ingersoll-Rand Co., 11 Broadway, New York 4.*



**TIRE REMOVER**—New hydraulic tire remover is especially designed to facilitate breaking beads loose from the rims of large earthmover tires. The tool will operate on any tapered bead rim of Goodyear design, according to the firm's engineers, and saves time and labor. Portable and highly compact, the equipment consists of a ram assembly 19 in long and weighing 25 lb, together with a pump and hose to provide hydraulic pressure, the latter weighing 16 lb. These work on both front and back sides of the rim, making it possible to effect quick changes right on the job. Under actual test conditions tool has withstood an 18,000-lb pressure at one spot on the rim to break the bead loose.—*Goodyear Tire & Rubber Co., Akron, Ohio.*



**MOTOR GRADER**—New 34.7-hp Model D Allis-Chalmers motor grader features tandem rear-wheel drive for more driving power, tubular-frame design and rear-mounted engine-transmission construction for improved visibility. Specifically engineered for low-cost maintenance and lightweight construction work, the 8,500-lb machine is said by the manufacturer to offer unusual capacity for its size. The Model D is powered by a gasoline engine, has four working speeds, up to 18.61 mph forward and 2.87 mph reverse, and offers many A-C features found on heavier units.—*Tractor Div., Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

**UNDERCUTTER BIT**—Firthite C-5 undercutter bit, designed especially for use in Bowdil L-6000 cutter chains, requires no bit holder, it is stated. Perfect fit through a tapered lug behind the cutting edge eliminates wobbling of the bit in the chain, according to the company, thus insuring

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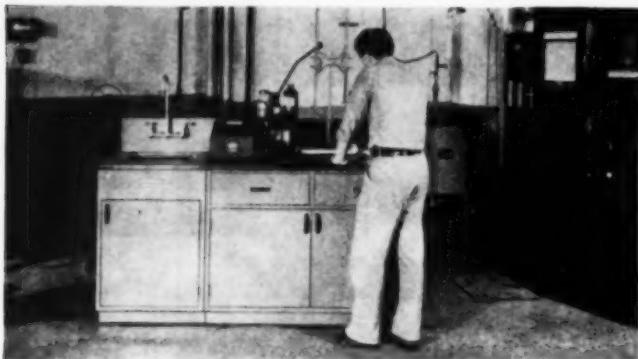
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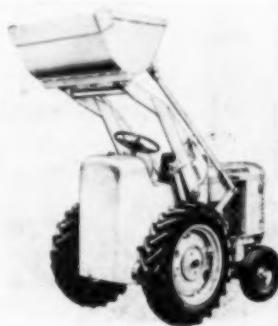
## Varied New Equipment Designed for Greater Mining Efficiency



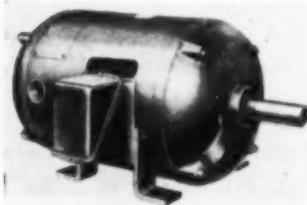
**TEST BENCHES** for use at test stations in coal-preparation plants now are available in any length and in a variety of designs by joining new Unitized prefabricated steel units. The 18 different types of all-steel units stocked in either 30- or 36-in heights utilize the newly developed plastic-impregnated stone called "Kemrock" for bench working surfaces and can be readily joined together to make complete benches as desired. Catalog available.—*Fisher Scientific Co., 714 Forbes St., Pittsburgh 19, Pa.*

longer life of the carbide and better performance of the chain. The lug fits into a slot in the chain and makes movement of the bit impossible during operation. The tougher, harder carbide tip, measuring  $\frac{3}{8} \times \frac{3}{8} \times \frac{1}{8}$  in, means longer life and keener cutting. The forged shanks are self-gaging and can be quickly and easily inserted into, or removed from, the chain. Firthite C-5 undercutter bits outlast steel bits as much as 100 to 1 under average cutting conditions and, because no bit holder is needed, an additional savings of 45¢ per bit can be effected, the manufacturer states. Catalog Section 90-000 available.—*Firth Sterling Steel & Carbide Corp., McKeesport, Pa.*

or without feet.—*Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.*



**LOADER**—Model TL-B Tractor-Loader features 10-cu ft standard bucket over the driving wheels, with the steering wheels in the rear which, according to the manufacturer, results in unusually good traction and easier steering. It is mounted on rubber tires and has a hydraulically controlled bucket that can be dumped in whole or in part to a height of approximately 5 ft. The bucket has a forward crowd action and an automatic "tilt-back" feature that permits getting a load without ramming. Over-all length with bucket down is 9 ft 4 in; over-all width, outside tire measurements, 4 ft 6 in; wheel base, 4 ft 1 in. The TL-B will go into a standard 6-ft-wide box-car door without backing up or jockeying around and, according to the manufacturer, will handle 20 to 25 tons of most bulk materials per hour on a 300-ft round-trip haul.—*Tractomotive Corp., Deerfield, Ill.*



**WOUND-ROTOR MOTOR**—New Form BW protected-type wound-rotor motor is built in NEMA Frames 224-505 in ratings up to 100 hp, and in larger frames up to 2,000 hp. Frames and end shields are dripproof, it is stated. In addition, these motors are available as splashproof and totally-enclosed non-ventilated. Other mechanical modifications include NEMA floor-, sidewall- and ceiling-mounting assemblies, and NEMA C-face and D-flange mounting. Both C-face and D-flange motors are available for horizontal or vertical operation, with



**ALTIMETER**—Described as the first such instrument ever made, new Micro-Altimeter is graduated in intervals of 1 ft over a range of 6,000 ft, and is said to be accurate to 1 ft and sensitive to altitude changes in inches. This easily portable surveying instrument weighs only 4½ lb and permits, according to the company, making surveys in one-tenth the time with an accuracy and dependability hitherto unknown in this type of instrument work. Model M-1 described above is the first of the new MICRO series and will shortly be supplemented by the Model M-5 with a range of 15,000 ft graduated in 5-ft intervals and also the Model MM-1 with a range of 5,000 m graduated in intervals of 1 m. Included with each instrument is a magnifier, thermometer and full operational procedures.—*American Paulin System, Los Angeles, Calif.*

**GOGGLE**—New welders' goggle features compression molding of extremely strong, durable, non-flammable and moisture- and heat-resistant phenolic compound. Features cited by the maker include: indirectly ventilated louver side shield; individually molded non-reflecting eyecups which provide a snug, pleasant fit and will



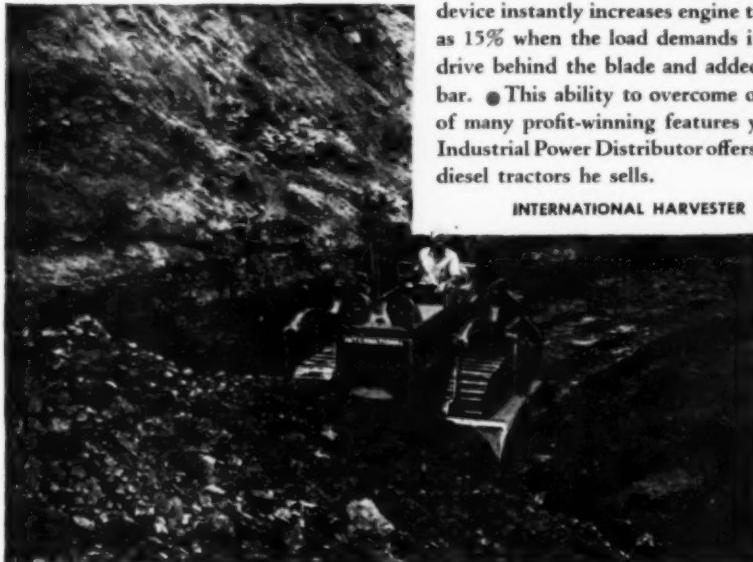
withstand considerably more impact than conventional goggles; chain bridge enclosed in a form-fit plastic-covered tube which rests lightly on the nose; large lens rings; one-piece rubber headband; and improved overall style and appearance. The goggle is fitted with 50-mm-round Noviweld lenses in Shades 3, 4, 5, 6 or 8; also Noviweld Didymium lenses in Shades 3, 4, 5 or 6.—*American Optical Co., Southbridge, Mass.*



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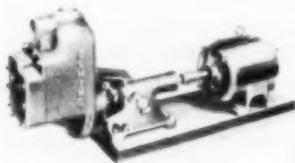


# INTERNATIONAL INDUSTRIAL POWER

## New Pumping Units Built to Handle Various Mine Conditions



**DEEPWELL PUMPS**—Newly redesigned line of deepwell pumps feature improved appearance, simplified access for maintenance and lubrication and other operating and construction improvements. Available for widely varying well diameters, capacities and heads, three assembly sizes fit wells from 6 to 24-in or larger. Several impeller designs are standard for each size in each of the three bowl types and provide more than 100 individual impeller designs of varying hydraulic characteristics, the company states.—*Byron Jackson Co., Pump Division, Terminal Annex, Box 2017, Los Angeles 54.*



**SELF-PRIMING PUMPS**—Six stationary models of these pumps cover a range of capacities from 10 to 300 gpm against heads up to 250 ft. One portable type has a capacity range of 10 to 90 gpm against respective heads of 80 to 15 ft.

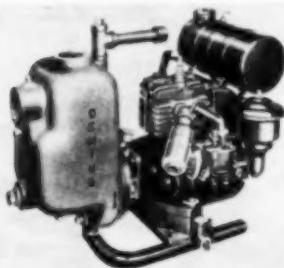
Priming is fast, automatic and reliable, the company states. A positive non-siphoning feature assures automatic repriming regardless of the amount of backwash or suction-line surge encountered when the pump stops. These pumps are completely self-priming on suction lifts up to 25 ft.

Semi-enclosed non-clogging impeller permits passage of usual-size solids encountered in dewatering service. Impeller is adjustable for wear. Pump casing is bolted to heavy-duty support head. Shaft operates in two deep-grooved oversized ball bearings to resist severe use.

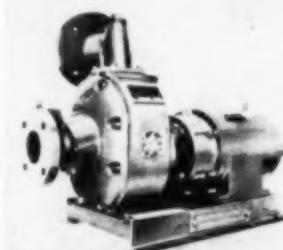
Certain models are designed with

casing and stuffing box separate from and bolted to support head. This type of construction makes it possible to adapt the pump for handling corrosive liquids as only the liquid end parts need be made of special alloys while the support head can be standard cast-iron construction with resultant economy.

All stationary models are equipped with electric motors of the proper characteristics. The portable type is equipped with a 1½-hp four-cycle air-cooled gasoline engine with high tension magneto. Bulletin No. 3300-A available.—*Deming Co., Salem, Ohio.*

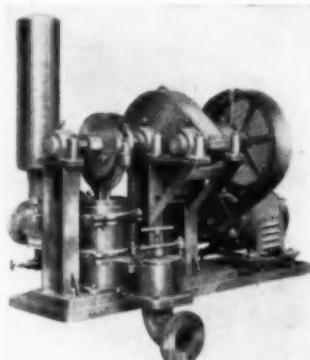


**PORTRABLE PUMP**—Designed for a wide variety of drainage or water-handling jobs where electric power or belting facilities are not available, new self-priming centrifugal pump is equipped with a 1½-hp four-cycle air-cooled gasoline engine with a high-tension magneto. Pump has cast-iron casing, bronze impeller mounted directly on engine shaft and a mechanical-type shaft seal which eliminates need for stuffing box and packing gland. Pipe connections are 1½-in. suction and 1½-in. discharge. Dimensions are: length, 20 in; width, 13 in; height, 19 in. Net weight is 83 lb. Performance ratings of this Fig. 3304 pump range from 1-gpm with 80-ft head to 98 gpm with 15-ft head.—*Deming Co., Salem, Ohio.*



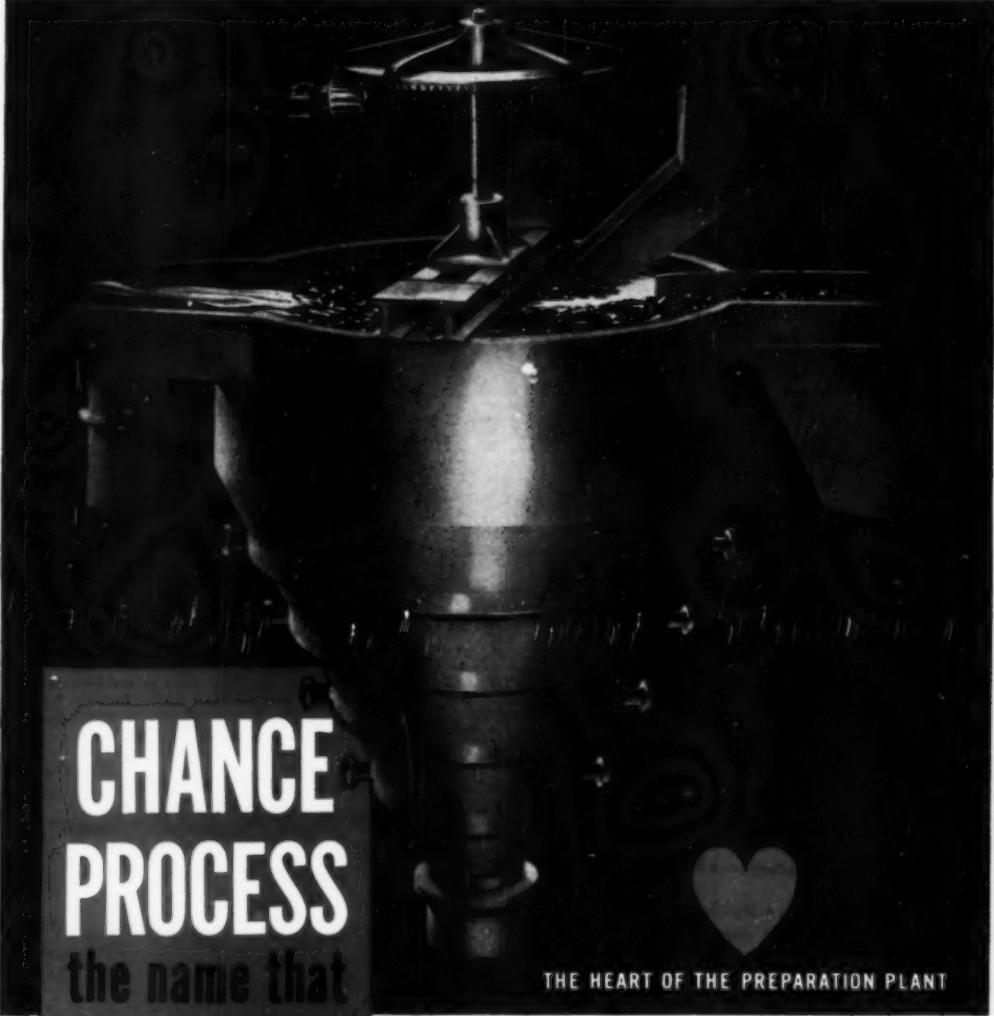
**CENTRIFUGAL PUMPS**—Expansion in its line of self-priming centrifugal pumps brings total offered by Marlow to 26 basic series, which in turn are available in numerous modifications and combinations of mountings, fittings and materials. Reported design changes on the basic

models include such improvements as a new cover plate engineered for increased strength and appearance, flanged suction and discharge connections and improved suction check valve. Included in the new line are electric horizontal long-coupled and vertical and horizontal close-coupled models, portable and stationary engine-driven models and belt-driven models. All feature Marlow's free-flow design, the exclusive "diffuser" method of priming in which the design of the pump itself enables it to prime automatically, and have no by-pass valves or other mechanical devices.—*Marlow Pumps, Ridgewood, N. J.*



**PUMPS**—New line of diaphragm and plunger pumps offered by Marlow Pumps includes motor- and engine-driven diaphragm and walking-beam plunger pumps and eccentric-drive plunger sludge pumps—a complete line of 30 basic models, sizes and types. From these basic models the range is broadened practically without limit, Marlow engineers state, by variations and combinations of materials, fittings and drives to meet virtually any heavy-pumping need of modern industry. The pumps have many applications in the transfer of liquids too heavy for self-priming centrifugals and, according to the manufacturer, they will pump liquids that are so heavy as to be nearly solids. The pumps are said to pass large quantities of bulky debris, will not readily air-bind or gas-bind, and will operate efficiently on suction lifts as high as 20 ft.

One of the outstanding features enabling all these pumps to remain virtually clogproof, according to the company, is the large ball valves guided by tapered ribs in patented valve chambers. Other carefully engineered features and rugged construction in every part permit heavy pumping for sustained periods and operation without causing maintenance problems. They will pump either a slow seepage or full capacity with each stroke without adjustment or change of speed, it is stated.—*Marlow Pumps, Ridgewood, N. J.*



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## MOBILoader's SHUTTLE CYCLE Boosts Locust Valley Efficiency!

One man loads 150 tons of coal per hour. That's because of the Athey ML4 MobiLoader's fast shuttle cycle — its response to hydraulic control — its teamwork with the power and traction of the "Caterpillar" Diesel D4 Tractor. Lost motion is eliminated!

The operator crowds the bucket into the stock-pile for a heaped load — reverses the unit to the truck-loading spot. And he's back for another load. Locust Valley Coal Co., Mahanoy City, Pa., owns 3 Athey MobiLoaders, because of performance like this.

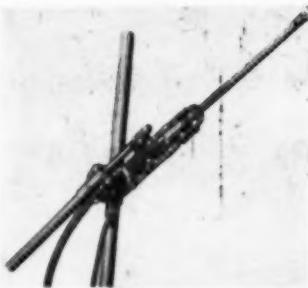
The Athey ML4 MobiLoader conserves tractor life as it saves time and distance on "straight line" tonnage-boosting operations.

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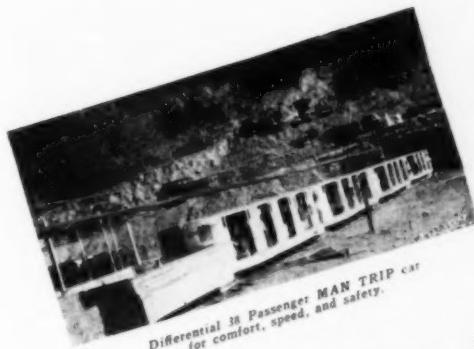


**AIR-FEED SINKERS**—Two new air-feed sinkers employ light fast-hitting drills and an integral-reverse air-cylinder-type feed. The HC10R (illustrated) and HC23R drills are claimed to have drilling speeds equal to 3-, 3½- or 4-in. drifters in most types of ground, with the air consumption of 45- and 80-lb sinkers respectively. This performance is attributed to the lighter, faster blows of the HC drills and the steady air-cushion feed characteristics of the cylinder-type feed. LeRoi officials state that the HC10R and HC23R have proven to be one of the few American-made drills to operate satisfactorily with carbide-insert bits and make them last long enough to be used economically. The HC10R sinker weighs 142 lb; HC23R, 170 lb, or up to 70 lb lighter than power-feed drifters, the company states. Bulletin RD-6 available.—Le Roi Co., 12500 Berea Road, Cleveland 11, Ohio.



**TAKE-UP**—New wide-slot SC ball-bearing take-up unit consists of a deep-grooved precision bearing with large balls and retainer to minimize wear enclosed in a strong well-designed outer housing with wide milled slots or ways on each end for supporting guides. The housing has a hole for receiving the unthreaded end of an adjusting screw.—Dodge Mfg. Corp., Mishawaka, Ind.

**GASOLINE ENGINES**—Three new Hercules 4-cylinder gasoline engines recently announced for general-purpose power application are: Model JX4E, 164-cu in displacement; Model JX4C, 188-cu in displacement; and Model JX4D, 214-cu in displacement. The JX4 Series is equipped with five main bearings and the crank-



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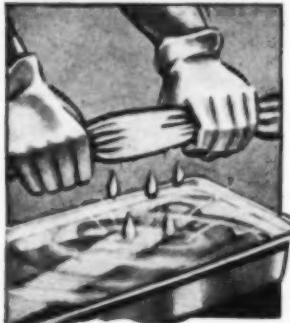
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Streamlining your blasting operations with Seal-Tite Tamping Bags saves labor, speeds up shooting and reduces cost. Supplies of dummies are made up quickly and easily and are stored underground under humid conditions—and they're always handy and ready for use.

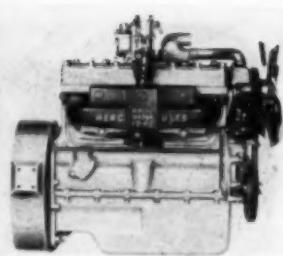


You'll be convinced when you see Seal-Tite Tamping Bags put to the severest of tests. They're even kept completely underwater for long periods. Then their tough chemically-treated, high wet-strength kraft is given the tear test in comparison with conventional bags. The safety-seam is submitted to pull-apart tests. You'll see for yourself and you're invited to make your own tests.

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shaft is counterbalanced for double assurance of smooth, vibrationless operation and to reduce bearing loads, the company reports. Other features cited by Hercules include a Tocco-hardened crankshaft, precision-type bearings, high-turbulence design of combustion chambers to provide maximum power delivery and operating economy, pistons of special alloy aluminum and an efficient and ample cooling system.—*Hercules Motors Corp., Canton, Ohio.*



### MATERIALS-HANDLING UNITS

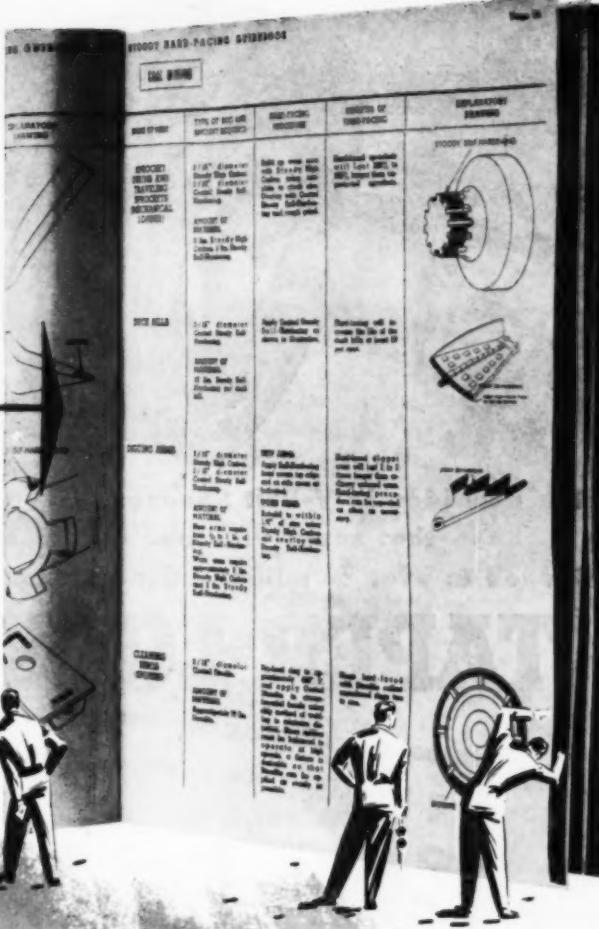
—Three new self-propelled rubber-tired units can be equipped for shovel, crane, clamshell, dragline or pull-shovel operation. Type 34-T has two engines, one in the rotating assembly powering all shovel and crane operations and the other in the truck for propelling the carrier. It features a five-speed main transmission and two-speed auxiliary transmission for 10 speeds forward and two reverse. Type 34-M and Type 604-M are equipped with one motor in the rotating assembly that supplies power for all operations, including propelling in either direction. Type 604-M (illustrated) is equipped with oscillating tandem-type rear axles, said to provide extra flexibility when working on uneven terrain. Lifting capacity is 35 tons.—*Lima Shovel & Crane, Lima-Hamilton Corp., Lima, Ohio.*

**CLAMP METER**—New ac clamp ammeter and voltmeter provides five current ranges up to 1,000 amp and three voltage ranges up to 700 volts. Known as Model 633 Type VA-1, this instrument is designed to measure alternating currents and voltages without interrupting electrical service. Jaws will accommodate conductors, bare or insulated, up to 2 in. in diameter. Voltage measurements

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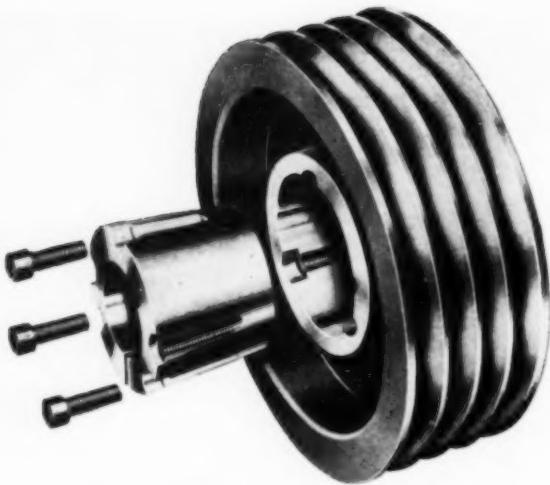
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DODGE MANUFACTURING CORPORATION  
MISHAWAKA, INDIANA

**DODGE**  
→ of Mishawaka, Ind.

CALL THE TRANSMISSIONER, your local Dodge Distributor, for information on new and better methods of transmitting power. Look for his name under "Power Transmission Equipment" in your classified telephone book.

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR  
SUBSIDIARY, ETCHING COMPANY OF AMERICA,  
1520 MONTANA STREET, CHICAGO 14, ILLINOIS



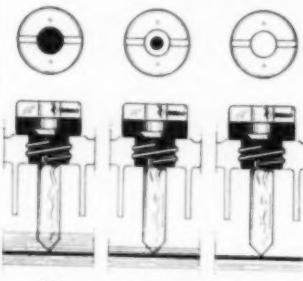
are made by connecting a set of clip-on voltage leads to the line and the screw-type terminals recessed in the side of the meter, the company states. Current and voltage measurement can be made almost simultaneously by rotating the thumb-selector switch to either the ampere or volt position. A pointer stop has been provided to show motor-starting currents. Rated accuracy, the company states, is 3% of the full scale range (each of the eight ranges) when used on frequencies between 50 and 70 cycles.—*Weston Electrical Instruments Co., Newark 5, N. J.*

## Equipment Shorts

**WELDING HOSE**—New Duo-Weld twin oxyacetylene hose consisting of separate red and green lengths joined by a thin strip of rubber may be separated into single lengths when desired without tearing into the cover of either hose.—*B. F. Goodrich Co., Akron, Ohio.*

**POWER UNITS**—To meet a demand for broader application of the "DIX4" series of four-cylinder diesel engines, Hercules Motors Corp., has made available the DIX4B and DIX4D models as closed-type power units. The "DIX4" series comprises two bore sizes: DIX4B, 3 1/4-in bore, 4-in stroke, with a piston displacement of 133 cu in; DIX4D, 3 1/2-in bore, 4-in stroke, with a piston displacement of 166 cu in.—*Hercules Motor Corp., Canton, Ohio.*

**EYESHIELD**—New eyeshield made of transparent plastic with a hinge-type device for attachment to MSA Skullgard protective caps or hats is said to offer positive protection against hazardous flying particles and insure non-fogging vision and easy wearing comfort over long periods. Bulletin DK-14 available.—*Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh 8.*



**STORAGE - BATTERY VENT PLUG**—New translucent plastic vent plug, named the "Televet," which indicates at a glance whether the battery needs water, is available at slight extra cost for all new Gould

# Lepley MINE EQUIPMENT

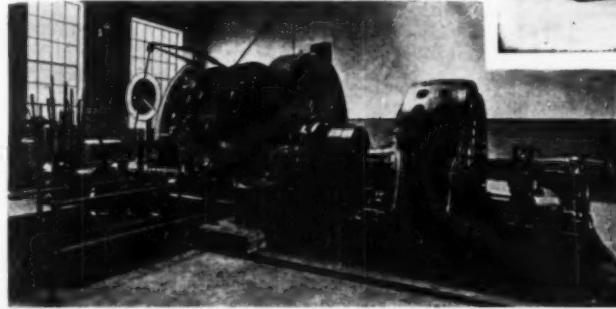
COST REDUCING

For nearly 80 years we have pioneered in the construction of equipment designed to stand up under the hardest kind of service—and low enough original cost to keep overhead and depreciation within reasonable limits.

On this page is just a sample of the operating equipment we supply. Other items available: Steam or Electric Hoists and Mulesies, Self Dumping Safety Cars, Bottom Dumper Cages, Overrunning Skips, Overrunning Cages (End Dumps), Solid Car Side Dump Cage, Bottom Loading Skips, Hard Steel Liner Head Sheaves, Shaft Bearings, Rotary Dumps, Mine Fans, Mine Pumps, Revolving Slate Dump Laries, Rectangular and Beehive Coke Oven Machinery, Fort-Pitt Mine Equipment and allied equipment.

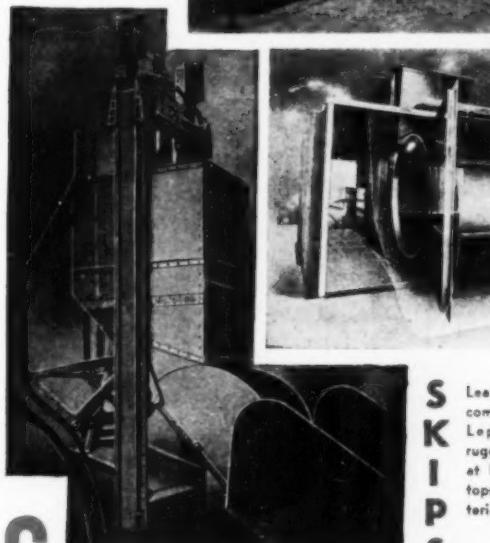
We have no "standard" hoist line—each design is based on a study of your needs. Steam and electric shaft and slope hoists available.

## HOISTS



## CAGES

Simplicity, ruggedness, safety and low maintenance are stressed in the design of Lepley Cages—your answer for efficient handling.



## FANS

Reversible supply or exhaust fans to suit your mine. Sizes up to 35 ft. in dia. by 8 ft. face. Produces 700,000 cu. ft. min. at 10.3 inches water gauge.

*Write—ASK FOR*

**DESCRIPTIVE  
BULLETINS**

**SEND US YOUR PROBLEMS**

**S K I P S**  
Leading coal mining companies testify—Lepley Skips meet rugged requirements at lowest cost . . . tops for efficient material handling.

**CONNELLSVILLE MFG. & MINE SUPPLY CO.** CONNELLSVILLE PENNA.

# "VIC" TELLS HOW

## THE ALL-VICTAULIC LINE LEADS TO L-O-W PIPING COSTS!

Want minimum piping costs, and a permanent solution to piping problems? . . . Victaulic Couplings, Victaulic Full-Flow Elbows, Tees, and other Fittings are your answer!

A complete VICTAULIC Piping System will save you hours of extra work . . . and lots of extra dollars. All-Victaulic Installations can't be beat for on-the-spot flexibility and all 'round simplicity!

Engineered for quick assembling and leak-proof dependability . . . that's Victaulic Couplings and Fittings. A simple two-bolt design for quick and easy hook-ups . . . a standard T-wrench is the only tool you need for making connections. Here's modern piping simplicity with long-lasting, positive-locked joints that will stand up under extreme pressure, vacuum, or strain conditions.

ALSO for fitting those pipe ends the easy - to - use "Vic-Groover" grooves 'em automatically in half the time of a conventional pipe threader!

**WRITE TODAY** for these 2:

- \*Victaulic Catalog and Engineering Manual No. 44 . . .
- \*\*"Vic-Groover" Catalog No. VG-47.

**FOR FULL ECONOMY... MAKE YOUR PIPING SYSTEM ALL VICTAULIC!**

SELF ALIGNING PIPE COUPLINGS

# VICTAULIC

EFFICIENT FULL-FLOW FITTINGS

**VICTAULIC COMPANY  
OF AMERICA**

30 ROCKEFELLER PLAZA, N. Y. 20, N. Y.  
Victaulic Inc., 727 W. 7th St., Los Angeles 14, Cal.  
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For Export outside U. S. and Canada: PIPECO  
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"Z"-type batteries. Since electrolyte levels are determined without unscrewing the Telelevel, time is saved, unnecessary watering is avoided, filling is assured when required, passed-over cells are detected and better supervision results, it is pointed out.—*Gould Storage Battery Co., Trenton, N. J.*

**DIESEL STARTER**—New air-cracking motor for quick dependable starting of diesel engines has a 30-to 40-gal tank precharged from the mine's compressed air system, weighs 43 lb, occupies no more space than an electric starter and can be readily installed.—*Leete-Neville Co., Cleveland, Ohio.*

**HAND LUBRICANT PUMP**—Utility Master hand-operated barrel-type pump is a lightweight, compact portable unit operating at lifts up to 20 ft; may be used with light or heavy liquids at a capacity of 10 gal per 120 revolutions or operated as slowly as 30 rpm to transfer 2½ gpm. Bulletin 4-25A available.—*Romec Pump Co. Div., Lear, Inc., Elyria, Ohio.*

**GENERAL-PURPOSE WINCH**—Compact planetary-type winch mounts in any position on 5x5½-in surface, has a 4-in dust-protective drum, overall length of 6½ in and develops a 600-lb direct cable pull.—*Lewis-Shepard Products, Inc., 268 Walnut St., Watertown 72, Mass.*

**GOOGLE**—Chipper's goggle compression-molded of a non-flammable moisture- and heat-resistane phenolic compound features dome metal side screens that provide greater cup area for cooler, safe ventilation and more side vision; available with several types of lenses.—*American Optical Co., Southbridge, Mass.*



**BARREL STAND**—Wheel-mounted Wizard barrel stand permits one man to raise heavy drums and barrels into position for draining or move or store them with a minimum of effort.—*Modern Equipment Co., 2007 Cuming St., Omaha 2, Neb.*

**CRANKCASE LUBRICANT**—New-type additive crankcase lubricant, Bustrux X.H.D. motor oil, designed for use both in light- and heavy-duty



# TOUGH on delays



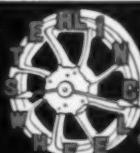
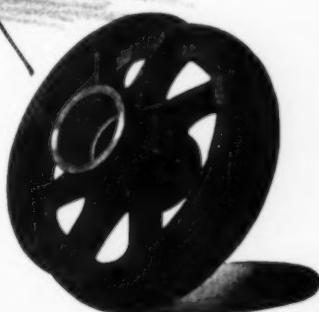
## **STERLING** CAST STEEL WHEELS

Will eliminate delays—save time  
and labor without any additional  
expenditure.

Write for your copy of the new Sterling  
bulletin "More Efficient Mine Car Operation"

*Let us present the facts!*

Representatives: R. E. GERDETZ EQUIPMENT CO., Law & Commerce Bldg., Box 423, Bluefield, West Virginia. H. F. HILLHOUSE JR., 20 N. 21st St., Birmingham, Alabama. J. E. Nease, 720 Rossleaw Ave., Pittsburgh, Pennsylvania. SERVICE SUPPLY CO., Hawley Bldg., Wheeling, W. Va. WETZEL EQUIPMENT AGENCY, 375 Southwest Temple St., Salt Lake City, Utah.



# Sterling

STEEL CASTING CO.  
EAST ST. LOUIS, ILLINOIS

IT'S TIME TO RE-WHEEL  
WITH STERLING CAST STEEL!



## Fire Hates This Building



One big reason why Standard ARMCO STEELOX Buildings are so popular with mining men is their fire-resistant, all-steel construction. You gain added safety for men and materials. Insurance rates are lower. And replacement and maintenance problems are simplified.

STEELOX Buildings are excellent for either permanent or temporary sites. It's a simple matter to dismantle, move and re-erect one of these buildings. A small, unskilled crew does the job in a matter of hours. Even after several such "moves" your building remains tight and dry.

You'll like the way STEELOX Buildings stay neat and attractive year after

year. There is nothing to get out of order—nothing to crack, warp or rot. Individual sections are made of 18- and 20-gage ARMCO Galvanized Steel. This durable material is two or three times heavier than ordinary galvanized roofing and siding. Long service is assured.

There is a type and size of ARMCO STEELOX Building to meet specific mining needs—powder magazines, head houses, engine rooms, cap storage, utility buildings, offices and many others. Write today for complete information. Armco Drainage & Metal Products, Inc., 775 Curtis Street, Middletown, Ohio.

Export: The Armco International Corporation.



**ARMCO STEELOX BUILDINGS**

automotive equipment, reportedly contains 10 times as much additive as some premium oils, with a resultant slowing of additive depletion rate, greater resistance to corrosion and improved engine performance—*Warren Refining & Chemical Co., Cleveland 14, Ohio.*



**TROLLEY HOISTS**—New Beam-Hugger trolley hoists reportedly reduce head room to the length of the hook only and add 17 to 51 in more plant working space; available in 13 sizes from 1- to 24-ton capacities in either plain or geared trolley types. Bulletin BH-49 available.—*David Round & Son, Cleveland 5, Ohio.*

**ALUMINUM PRODUCTS**—Arrangements have been completed by the U. S. Steel Supply Co. to stock the complete line of Reynolds Metals aluminum mill and buildings products at its 14 warehouses throughout the country.—*U. S. Steel Supply Co., 208 S. LaSalle St., Chicago 90.*

**WHITEPRINTER**—Volumatic Model 93 whiteprinter designed to handle a large volume of duplicating work reproduces directly and without intermediate steps any copy drawn, written, typed or printed on translucent mediums from post-card size up to 42 in wide and in any length, at speeds up to 105 sq ft per min. Bulletin A1053 available.—*Charles Bruning Co., 4754 W. Montrose Ave., Chicago 41.*

**DINNER PAIL**—New heavy-gage all-aluminum rust-proof round dinner pail is fitted with tight 2-qt food and 3-qt water compartments. Features include roll-rim edges, overlapping collars to prevent water spillage, and simple bayonet and spring locks that seal out all dirt, dust and moisture.—*Republic Stamping & Enameling Co., Canton, Ohio.*

**COMMUNICATION SYSTEM**—Wheeler self-powered communications systems requiring neither batteries nor other power for either talking or ringing has been extended to include a master phone that can select and signal any or all of up to 11 sub-stations or be rung by any of them, with operation possible of up to six of the sub-stations on a common-talking basis, plus a multi-selective system of 12 master phones, each of which can selectively ring any or all of the others. Circular SA-8 avail-

# Five times

MORE POWERFUL THAN DYNAMITE!

Although the release of power from coal is accomplished by different means than are used with dynamite, the measurable power produced shows a one-to-five variance in favor of coal!

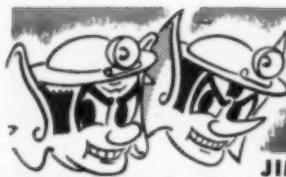
-BUT THIS ENERGY  
CAN BE LOST FROM COAL  
BY IMPROPER CLEANING

Your coal has a tremendous power potential . . . but this energy can be lost from the coal by improper cleaning and preparation methods. The most important markets are buying scientifically prepared coal because they know it will deliver the most power per pound and the most value per dollar. Are your preparation methods producing coal of uniformly high chemical and physical quality to attract and hold these premium markets?

THE HEART OF THE PREPARATION PLANT

**FAIRMONT MACHINERY COMPANY**  
**FAIRMONT, WEST VIRGINIA**

Designers and Constructors of Chance Sand Flotation Process for Wet Cleaning and American Pneumatic Separator for Dry Cleaning



# COULD THIS HAPPEN IN YOUR MINE?

JIM and TIM . . . the Mining Grim—lins

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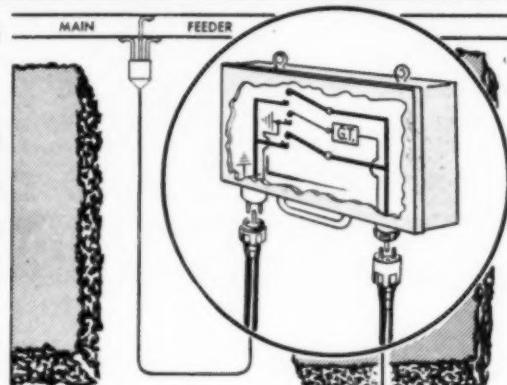
## Safety Circuit Centers

### *Minimize* **MINING FIRE HAZARDS DAMAGE TO EQUIPMENT and ELECTRICAL SHOCKS**

Through automatic breakers, MINES Safety Circuit Centers make use of the safety ground wire in Twin G, PG, PCG or type W cables to obtain instantaneous "two-way" protection to personnel and equipment. In action the automatic breakers open—(1) when current drawn through breaker exceeds its normal setting—(2) when mangled cable or any insulation failure causes a flow of current in cable's safety ground wire. Trip is instantaneous and can be readily reset through outside lever for repeat protection performance. Available with one to four outlets in Permissible or Dust Resistant metal housings MINES S. C. C. units are furnished with sectionalized cable assemblies that drop their load in the process of opening.



Suitcase S. C. C. (illustrated) is used to supply power to one machine i. e. Loader, Shuttle Car, etc. It has three breaker poles. Two are for line current . . . the third being wired in series through safety ground trip to the cables ground wire.



*Consult a  
Joy Engineer*

He will welcome the opportunity to help you plan a Safety Circuit Center layout to fit your individual needs . . . without obligation.

Any cable with ground wire or shield can be used with MINES Safety Ground Trip Safety Circuit Centers.

SALES AND SERVICE TO THE MINING INDUSTRY EXCLUSIVELY BY  
**JOY MANUFACTURING COMPANY**  
HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

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**MINES EQUIPMENT COMPANY**  
4229 CLAYTON AVE. — MINES — ST. LOUIS 10, MO.

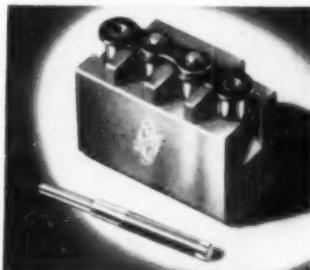
able.—Wheeler Insulated Wire Co., 150 E. Aurora St., Waterbury 91, Conn.

**BOOKKEEPING MACHINE**—New easily operated posting-and-figuring machine is designed to give smaller business firms mechanical-bookkeeping advantages; posts accounts receivable, accounts payable, general ledger, payroll and other records; also can be used for work involving addition, subtraction, multiplication and division, with a complete record of all work automatically printed to permit checking of figures.—Underwood Corp., 1 Park Ave., New York 16.

**VALVES**—Improved Lunkenheimer line of 125-lb S.P. bronze globe, angle and check valves reportedly offer many new design features for greater strength and longer service life. Folder 582 available.—Lunkenheimer Co., Cincinnati, Ohio.

**MOTOR STARTERS**—New line of ac magnetic reversing across-the-line-type starters include three-pole type for polyphase motors up to 200 hp, 550 volts, 60 cycles, and four-pole units with ratings of 7½ hp, 550 volts, 60 cycles maximum, for use with externally reversible single-phase motors or the four-wire split-phase capacitor or repulsion-induction types.—Ward Leonard Electric Co., 31 South St., Mt. Vernon, N.Y.

**BUSHING ADAPTER**—Adapters for Taper-Lock bushings for use where it is more convenient to use a straight bore in the hub than to drill and taper-bore hubs to accommodate bushings consist of taper-bored sleeves that fit into the straight bore of the hub.—Dodge Mfg. Co., Mishawaka, Ind.

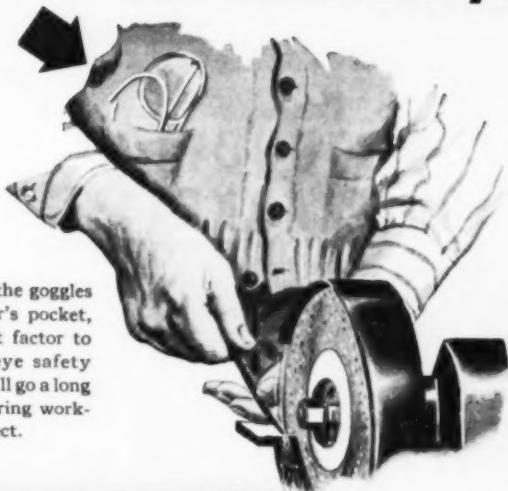


**ROLLER-CHAIN REPAIR**—New chain tool consisting of an anvil, fork and punch is said to prevent binding that often makes disassembly of chain difficult and causes distortion of the pin link; available in sizes fitting any standard roller chain.—Atlas Chain & Mfg. Co., Castor & Kensington Aves., Philadelphia 22.

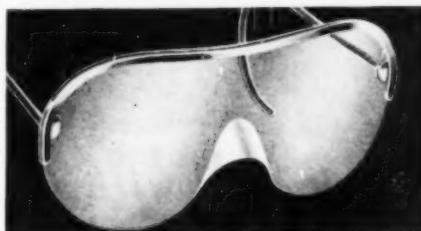
**TELEPHONE WIRE**—New Ironite mine telephone wire is stated to be greatly superior to the old Ironite in every way: a new stronger iron conductor which can stand longer drops;

# WILLSON . . .

## has the remedy!



In order to get the goggles out of a worker's pocket, add the comfort factor to protection in eye safety equipment. You'll go a long way towards curing workers of such neglect.



FeatherSpec Style FW2

Here is comfort in nine-tenths of an ounce. WILLSON FeatherSpecs\* with a large, overall plastic lens rest lightly on the nose and can be worn all day—even over prescription spectacles—with-out fatigue. Workers say they hardly know they are wearing any eye protection. Yet they prove adequate protection on many jobs such as light grinding, woodworking, spot welding and inspection of work in process.

If you want your investment in safety equipment to pay off—don't neglect comfort in your specifications.



### DAILY REMINDERS

Daily reminders such as WILLSON "Blind Man" safety posters keep workers in hundreds of plants aware of the need for personal safety measures. Supplies are available on request.

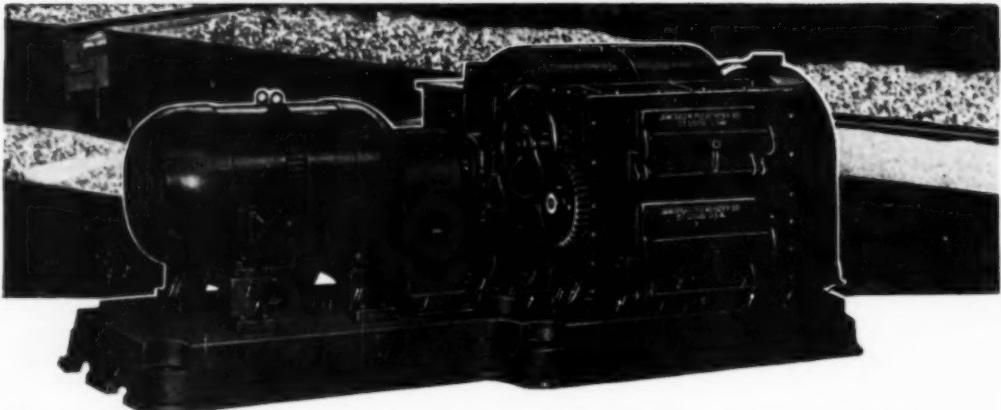
**WILLSON**  
Established 1870\*

WILLSON PRODUCTS, INC. • 239 WASHINGTON ST. • READING, PA.





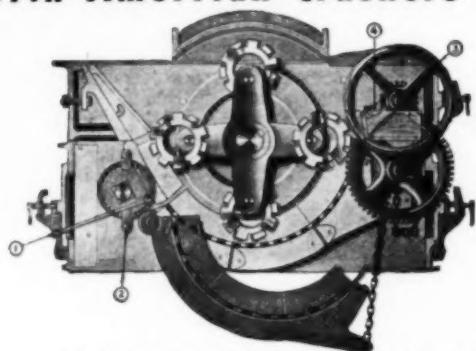
## PRODUCTION GOING STRONG but MARKETING GOING WRONG?



### *Get better size control with American Crushers*

When tonnage gains below ground are offset by improper ratios of unwanted, fines and unbalanced screen rejects, it's time to survey and revise your coal crushing operation.

American Rolling Ring Crushers assure better size control with their exclusive, patented, shredder ring action. Reduction is readily controlled to obtain highly marketable or pulverizer sizes with minimum of carbon dust and with no oversize.



Only Americans have the shredder rings each with 20 cutting edges that split coal instead of crushing it. Revolving freely on its own shaft, each ring deflects from tramp iron, etc., which is propelled to metal trap.

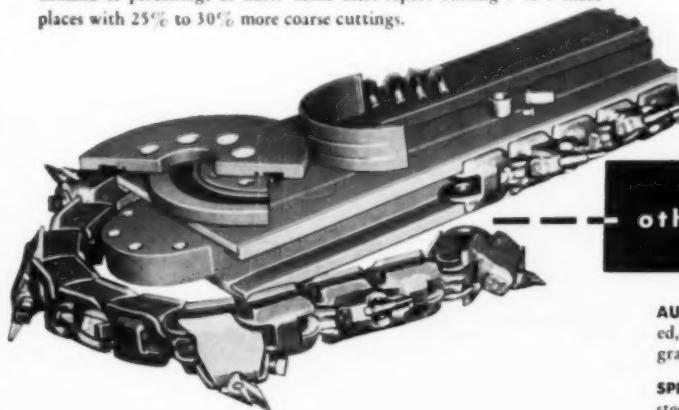
*Send for special "AC Coal Crushing Bulletin" — yours for the asking.*

**American** PULVERIZER COMPANY  
*Originators and Manufacturers of*  
*Ring Crushers and Pulverizers*

1119 Macklind Avenue  
St. Louis 10, Mo.

## Bowdil concave cutter bits give 15% to 20% longer life

Actual operating records prove Bowdil Concave Cutter Bits give 15% to 20% longer life than ordinary bits . . . plus important power savings. The concave face permits Bowdil Bits to function efficiently when worn down 25% farther than others without increasing power demand or percentage of dust. Some users report cutting 3 to 5 more places with 25% to 30% more coarse cuttings.



### other BOWDIL cost cutters

## FABRI-FORGED cutter bars give longer service, produce more coarse cuts, save power

- 1. Longer Life.** Fabri-Forged Cutter Bars are popular with machine runners, foremen, maintenance men and operators alike because they give longer, trouble-free service . . . eliminate shut-downs for repairs. Built throughout of high-strength alloy steels with large bearing surfaces, they stand up longer in tough service.
- 2. Stronger.** All-welded construction eliminates rivet holes in the body, retaining full strength of the material.
- 3. Less Deflection.** Actual tests show that while conventional bars 4" thick will bend under 25 to 35 tons pressure between three foot centers, Fabri-Forged Bars 3" thick will withstand 40 to 45 tons before bending. Fabri-Forged Cutter Bars are available to fit 75 different types of short wall, long wall, aricwall and track cutting machines of all popular makes.

**AUGERS AND DRILL BITS** specially heat treated, give longer service . . . eliminate grabbing.

**SPROCKETS** of long-wearing, tough alloy steel specially heat-treated for hard service. Sprockets in stock for all popular makes of machines.

**AUGER BITS.** Tough, long-wearing. Fish tail, four point and two point clay bits.

**BOWDIL ROPE SOCKET.** Safe, easily installed, easily removed, light, strong, protects the rope by providing a straight pull.

**SPIKE PULLER.** Detachable claws, easily removed for replacement or change of spike size. Won't bend spikes.

**MINERS' PICKS.** Replaceable points heat-treated for long service. Designed for ideal weight and balance.

**BOWDIL CHOKE-ARC TRANSFER SWITCH.** Instantaneous in operation, dependable, trouble free.

**TWO-POLE CABLE AND REEL SWITCH.** Sturdy, dependable, durable.

# BOWDIL

COAL CUTTING EQUIPMENT  
CANTON OHIO

FIELD MEN AND REPRESENTATIVES IN  
Whitesburg, Kentucky; West Frankford, Ill.;  
Charleroi, Pa.; Denver, Colo.; Big Stone  
Gap, Va.; Williamson, W. Va.; Canton,  
Ohio; Birmingham, Ala.; Helper, Utah;  
Kansas City, Mo.; Centerville, Iowa;  
Topeka, Kansas; New Castle, England.

# How 6 Mines Profit

## by HEAVY-MEDIA SEPARATION

### PITTSBURGH SEAM



**SHIPS LOW-ASH PREMIUM  
FUEL FROM MIXTURE  
OF MECHANIZED AND  
HAND-MINED FEED**

Two mines feed 700 tons a day to the preparation plant of this progressive operator. One is completely mechanized for full-seam mining; the other uses hand loading and mule haulage.

Mixed feed from these mines runs 15.5% ash . . . 3.8% sulphur. To keep competitive, this operator installed a Heavy-Media Separation unit with a seven-foot cone. Run-of-mine mixture first passes over picking belts from which approximately 200 tons a day of lump coal are taken.

Approximately 400 tons a day in the  $2\frac{1}{4}'' \times \frac{1}{4}''$  size range are cleaned by Heavy-Media Separation at 1.60 gravity with a recovery of 90%. (There is practically no "float" in the "sink".) Ash content now averages 6.5%. The Heavy-Media Separation unit has shown very excellent rejection of refuse, which often includes massive pyrite and slabby material.

### LOWER KITTANING SEAM



**ECONOMICALLY CLEANS  
MIXTURE FROM STRIP AND  
DRIFT MINES. ELIMINATES  
PICKING . . . HALVES ASH**

Medium-volatile bituminous raw coal comes from a drift mine and a strip operation on the Lower Kittanning Seam. Feed averages 13% ash; is contaminated by the binder at the center of the seam and laminates at the top. Hand picking costs were high; quality and output were hard to maintain.

So the owners investigated Heavy-Media Separation; decided that the savings on six pickers (released for other work) justified a 70 tons-per-hour plant.

Now pickers are a memory. One man operates the Heavy-Media Separation unit which easily cleans 700 tons of  $2\frac{1}{2}'' \times \frac{1}{4}''$  a day at 1.45 gravity, recovering 92.7% coal analyzing only 7.46% ash, 1.43% sulphur and having 13,700 B.t.u.

### PITTSBURGH NO. 8 SEAM



**CLEANS FLUCTUATING  
RAW FEED EFFICIENTLY  
AT 100% ABOVE  
RATED CAPACITY**

Customer requirements for the  $1\frac{1}{4}'' \times \frac{5}{8}''$  coal call for 7% or  $7\frac{1}{2}\%$  ash according to end use. Wide variations in feed rate of this size occasionally occur resulting in fluctuating volume of refuse to be removed by cleaning equipment. The Heavy-Media Separation unit installed to clean this size handles the changes in feed rate automatically and without loss of cleaning efficiency. No special precautions are necessary to prevent loss of clean coal when feed rate drops.

This operating plant amply confirms our oft repeated contention that "Heavy-Media Separation can cope with large fluctuations in refuse-content without loss of volumetric or cleaning efficiency."

#### ILLINOIS NO. 6 SEAM



### SPEEDY INSTALLATION OF HEAVY-MEDIA PLANT KEEPS STRIP MINE WORKING PROFITABLY

The owners foresaw that prompt improvement in quality was imperative at this Illinois property in order to meet increasing competition. So they investigated Heavy-Media Separation: placed an order for immediate delivery of a "prefabricated plant." Within a few weeks components of a 40 tons-per-hour Heavy-Media Separation unit were arriving on the site. In less than three months the Cyanamid Field Engineer assigned to tune up the installation reported:

"This operator says he is now delivering the lowest-ash coal being shipped by any mine on the #6 Illinois Seam. Output in the 4" x 1/8" size range at 1.47 specific gravity separation runs under 7½% ash; has a 13,000 B.t.u. He's no longer worried about the 'buyers' market' in coal."

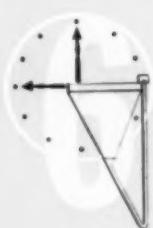
#### PITTSBURGH SEAM



### INCREASES RAW-FEED CAPACITY 22%. RECOVERS 50% MARKETABLE COAL FROM REFUSE

The existing cleaning plant of this prominent coal producer was re-circulating middlings to maintain grade. By adding a supplementary Heavy-Media Separation plant to clean this middling, raw feed to the existing plant was increased 22%. The Heavy-Media Separation unit cleans 250 tons an hour in the 3" x 1/4" range containing refuse from 40% to 70% (averaging 50%). This supplementary unit recovers up to 125 tons per hour of marketable coal; has been so satisfactory that the operator has installed a second Heavy-Media Separation unit to treat approximately 250 tons per hour of 7" x 3" raw feed which was previously hand-picked.

#### EAGLE SEAM



### SPEEDY CLEANING BY HEAVY-MEDIA SEPARATION PRODUCES 3.5% ASH COAL WITH 4% MOISTURE

We told this operator that Heavy-Media Separation cleans coal fast. Tests on his new plant show "marked" lumps on the clean coal screen 6 to 10 seconds after they hit the cone. That's fast cleaning . . . explains why a 7-foot cone can handle up to 75 tons per hour of the 2" x 3/16" fraction and produce extremely low ash, low moisture coal.

Cyanamid offers a complete range of Separation Processes by Specific Gravity Difference (Heavy-Media Separation and the Dutch State Mines Cyclone Separator) for new cleaning plants or as adjuncts to present washers. Prefabricated Heavy-Media plants with capacities up to 125 tons per hour are available for prompt delivery and speedy erection. Larger Heavy-Media units can be quickly designed through the accumulated experience of several well-known engineering firms.

With no self-interest in equipment manufacture or plant construction, Cyanamid can give you sound counsel based on unprejudiced tests in the Cyanamid Mineral Dressing Laboratory and Pilot Plant at Stamford, Conn. We will also cooperate with engineers of your choice on plant design and provide a Cyanamid Field Engineer to tune-up your Heavy-Media or Cyclone Separator unit.



**AMERICAN Cyanamid COMPANY**

MINERAL DRESSING DIVISION

30 ROCKEFELLER PLAZA

NEW YORK 20, NEW YORK



# 4 Wheel Drive PAYLOADER

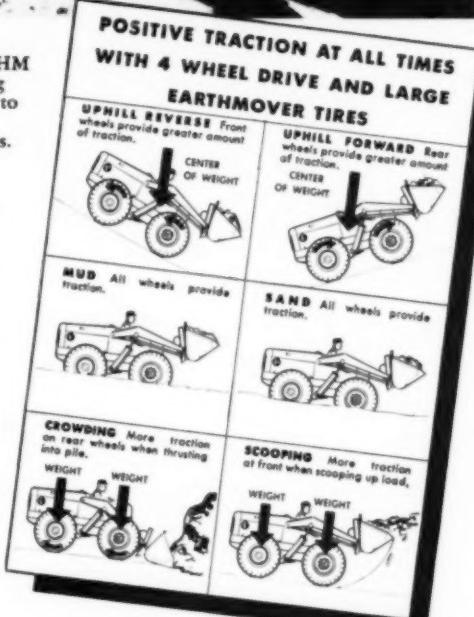


PROOF is in PERFORMANCE! Already the Model HM PAYLOADER is a formidable tool in the coal mining industry. Proven is its power, versatility and ability to speed-up stripping and loading operations in all kinds of weather and over varying ground conditions.

Upon four wheel drive and large earthmover tires is based the secret of this machine's tremendous traction and flotation. Its power-boosted rear wheel steering, 4 speeds in each direction and quick-acting forward-reverse control accounts for its unusual maneuvering speed. The Model HM travels anywhere and can dig, strip, load, carry or grade. It is used in the construction and maintenance of haul roads, works in borrow pits and serves as a practical utility unit. Its large pneumatic tires do not fracture or waste coal exposed in the vein!

This completely new and different tractor shovel is equipped with a 1½ yard bucket and is available with 76 HP gasoline or diesel power. Bulldozer Blade and Crane Hook attachments are quickly interchangeable with the bucket. Get the complete story on this efficient new PAYLOADER from your Hough Distributor or write The Frank G. Hough Co., 735 Sunnyside Avenue, Libertyville, Illinois.

WRITE for full information on any size of PAYLOADER, the 1½ yd. Model HM; the 1½ yd. Model HL; the ¾ yd. Model HF; the 10½ cu. ft. Model HA.



**PAYLOADER**  
Manufactured by THE FRANK G. HOUGH CO.



conductor protection by continuous zinc sheath ("Flozinc" process) providing an unbroken coating that will not crack in tying; blended and pre-aged rubber insulation for better adherence; protecting braid of combination long-staple cotton and mineral fibers for a very hard tough body, all stearine-pitch and powdered-mica finished.—*Paragon Electric Co., Two Rivers, Wis.*

**JACKHAMMER**—New medium-weight J-40 Jackhammer reportedly capable of drilling any kind of rock features powerful blows, strong rotation of drill steel and large-hole cleaning ability for fast drilling speeds, has a three-in-one backhead for speedier adjustment to wet, dry or blower-type drilling and is especially suited for use with Carb-tungsten-carbide-insert bits.—*Ingersoll-Rand Co., 11 Broadway, N. Y. 4.*

**RUBBER TIRE**—New "Mining Special" tire is designed with an extremely wide tread for greater flotation and extra thick reinforced shoulders for mine duty. The smooth sidewall reportedly resists cuts, snags and bruises, with gripping action improved by the extra-deep cleated self-cleaning treads. The tire is available in the following sizes: 7.50:15, 10 and 12 ply; 8.25:15, 12 and 14 ply; and 10.00:15, 14 ply.—*General Tire & Rubber Co., Akron, Ohio.*

**GROUSER STRIP**—Made of special carbon-manganese steel that resists wear, abrasion and chipping, Marquette Tractor-Strip is said to outlast the original grousers on tractors. Has superior welding characteristics, according to manufacturer. Any welder can quickly apply Marquette Tractor-Strip with inexpensive steel. Bulletin WA 4495 available.—*Marquette Mfg. Co., Minneapolis 14, Minn.*

**FIRE HOSE**—New "Matchless Carbized Fire Hose," reportedly designed as a high-strength hose highly resistant to acids and acid fumes, oil and gasoline, is constructed with a natural-rubber tube, two plies of chemically treated cotton-cord fabric and a Neoprene cover, and offers greater flexibility and light weight for various heavy duty uses, the company says.—U. S. Rubber Co., Rockefeller Center, New York 20.

**ELECTRIC SAWS**—Thor "Silver Line" portable electric saws, it is stated, feature exclusive long-shaft transverse-motor mounting for extra power and longer tool life. Six new models are available in 6-, 7-, 8-, 9-, 10- and 12-in sizes. Exclusive features include diecast aluminum housings, steel inserts for bearings and threads to maintain critical parts in permanent alignment; built-in saw blower, steel rip guide with adjustments for any thickness of material being cut, giant switches, smooth-operating automatic ball-bearing blade-guard with rubber snubber, fin-

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• If you deep-mine 500,000 tons of coal annually, we can *band you back in savings* \$250 for every \$15 you spend on an Osmose Timber Treating Program. Comparable savings are possible for larger or smaller tonnages. Osmosalts and Osmoplast are two highly potent wood preservatives that effectively combat decay and save operators thousands of dollars annually in timber replacement costs.

Remember: 15 to 20% of your timbers are of the permanent type and these, especially, should be safeguarded. Also remember, while timber is expensive today, the installation cost of making unnecessary replacements will be approximately twice as much as the timber itself.

You owe it to yourself, you owe it to your company to investigate the huge savings that are made possible by Osmose Products. Let us analyze your particular situation and report to you (without obligation) how much we can CUT your maintenance cost.



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Representatives in: Pittsburgh, Denver, Birmingham Ala., Stollings & Clarkberg, W. Va., and New York City



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Coalmaster Drilling  
Equipment

Chicago Pneumatic Tools

Cincinnati Electric Tools

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Gray Rock Brake Lining

Lincoln Lubrication

Equipment

Lincoln Welding

Equipment

Marlow Pumps

McCarthy Overburden

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National Batteries

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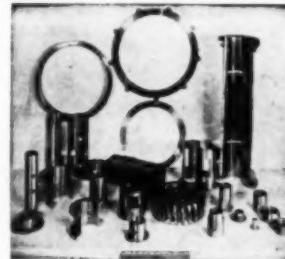
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NEW YORK CITY, Trans American Commerce Co., Inc., 145 Broadway. .... Phone 7-4340

ger-tip control for depth and bevel cuts, complete ball-bearing construction.—Independent Pneumatic Tool Co., 175 N. State St., Aurora, Ill.

### Industrial Notes

Templeton, Kenly & Co., Chicago, has appointed Mark C. Simpson division sales manager for Pennsylvania, with headquarters at Roscoe. Mr. Simpson formerly held posts with the Hockensmith Wheel & Mine Car Co., Phillips Mine & Mill Supply Co. and the Brown-Fayro Co.

Chain Belt Co., Milwaukee, has appointed Douglas Jones as manager of the Salt Lake City district office, operating as Douglas Jones Co., 1551 Redondo Ave.

Mack Trucks, Inc., New York, has appointed John G. Caley, formerly manager, southern division, national accounts department, district manager of the company's Birmingham (Ala.) direct-factory branch.

Roberts & Schaefer Co., Chicago, has appointed E. C. Carris assistant to Frank E. Mueller, president. Mr. Carris was formerly preparation manager, Island Creek Coal Co., Holden, W. Va.

American Steel & Wire Co., Chicago, has made the following sales appointments: Clarence C. Gilchrist, assistant general manager of Chicago-district sales, western-area sales manager; Roswell F. Curtis, eastern-area sales manager; and Howard B. McGuire, central-area sales manager; The latter two are newly established positions.

Food Machinery & Chemical Corp., Peerless Pump Division, has appointed Frank W. McCann, previously head of centrifugal pump sales at the company's Indianapolis (Ind.) works, manager of Atlantic-district sales with headquarters at 37 Wall St., New York. Robert H. Hull, previously at the Los Angeles works, replaces Mr. McCann at Indianapolis.

L. B. Foster Co., Pittsburgh, has opened a new \$150,000 plant at Houston, Tex., to handle steel rails and steel products in the Southwestern and western states and Mexico.

Joseph T. Ryerson & Son, Inc., Chicago, has announced the following executive changes: William G. Findlay, formerly manager of the company's Pittsburgh plant, transferred to Chicago as manager of the work-order division in charge of work-order sales for the 13 Ryerson-steel-service plants; A. L. Peterson, manager, St. Louis, plant, to Pittsburgh to succeed Mr. Findlay; and John M. Acee, former St. Louis sales manager, to succeed Mr. Peterson.

I-T-E Circuit Breaker Co., Phila-



Retail coal merchants have been quick to recognize the new era of Bituminous. As the link between public and producer, they have lost no time in acquainting consumers with the latest possibilities of this always basic fuel.

Naturally, their efforts have been aided by the development of new-style smokeless stoves and furnaces, and by the new efficiency of stokers. But their chief success has resulted from selling their customers on modern Bituminous, as found on the B&O.

For heating a small house or a large building, the right B&O coals are available. Produced and prepared at modern mines, they are thoroughly "laundered," and can be ordered in proper stoker sizes as well as in double-screened sizes for hand firing.

Now is the time to build your business on B&O Bituminous—for clean, reliable, efficient, economical heating. *Ask our man!*

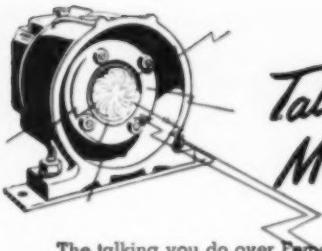
#### BITUMINOUS COALS FOR EVERY PURPOSE

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*Constantly doing things—better!*

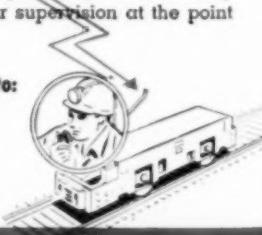


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The talking you do over Fenco Trolleyphone means bigger mine profits. Trolleyphone two-way communication gives you instant contact—and control—of every moving car and every operation in the mine. Exercises your supervision at the point where profits are made.

### Supervise your mine by Trolleyphone to:

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## Conveyor Troughs and Ball Frames that meet exacting requirements



Hendrick Shaker Conveyor Troughs are made of a special high carbon steel that offers great resistance to abrasion, and to bending or breaking stresses under weight of the coal. The sides of the troughs are shaped to give maximum resistance to buckling.

Troughs are made in standard

lengths of 10 feet, and 10 feet, 2 inches, but can be made up to 13 feet, 2 inches, in any desired size. Accuracy and uniformity in their construction are outstanding features. Hendrick Ball Frames give the troughs substantial support whatever the floor conditions. Write for full information.



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Perforated Metals  
Perforated Metal Screens  
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Mitco Open Steel Flooring.  
"Shur-Site" Treads and  
Armorgrids

adelphia, has appointed Fred Schmidt, formerly president of the Electric Power Equipment Corp., assistant to the president, W. M. Scott Jr.

**Hercules Powder Co.**, Wilmington, Del., has appointed J. J. Kelleher, formerly manager of the contractors' division, to the newly created position of sales manager, explosives department. L. C. Lebron, who joined Hercules 20 years ago, succeeds Mr. Kelleher in his former position.

**Hamilton Rubber Mfg. Corp.**, Tren-ton, N. J., has elected H. H. "Hobe" Todd a vice president. Mr. Todd has been in charge of sales for the company in the Midwestern territory for 30 years, with offices in Chicago.

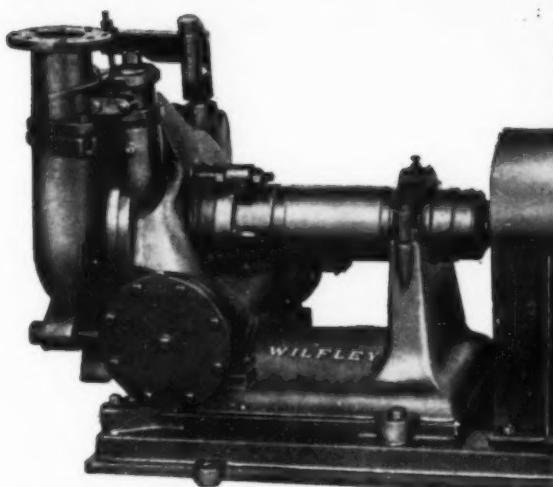
**Atlas Powder Co.**, Wilmington, Del., has appointed J. Charles Allen, assistant since 1929, chief engineer, succeeding J. W. Hanson Jr., retired. Charles G. Hersh, a member of the Atlas engineering staff since 1919, succeeds Mr. Allen as assistant chief engineer.

**Railway Bearing Co., Inc.**, Syracuse, N. Y., has appointed Alfons Alven, formerly president of Bearings Co. of America, Lancaster, Pa., as general sales manager.

**B. F. Goodrich Co.**, Akron, Ohio, has made the following personnel changes as a result of the retirement of Frank E. Titus, manager of the Pacific-coast division: Lawrence T. Greiner, manager, southwestern-division replacement sales, succeeds Mr. Titus; Conrad R. Helms, formerly manager of the Charlotte (N. C.) sales district, succeeds Mr. Greiner; Frank C. Haralson, regional store manager, southeastern division, succeeds Mr. Helms; and Donald C. Lacy, store manager, Atlanta district, succeeds Mr. Haralson.

**Edward J. Burnell**, vice president, general sales manager and director, the Link-Belt Co., died at his home in Winnetka, Ill., July 22, after an illness of several months. Mr. Burnell was born in Tondu, Wales, April 7, 1888, and later came to Catawissa, Pa., where he was buried, with his family, graduating from Lehigh University in 1910. Mr. Burnell served Link-Belt in many important capacities in engineering, sales and plant management. During the war he was on the advisory boards of the Machinery Branch, WBP, and the Chemical Corps of the War Department, and was consultant to the Reconstruction Finance Corp.

**Reliance Electric & Engineering Co.**, Cleveland, has announced the following personnel changes: Robert R. Magnetti, with 18 years' experience in the steel industry, manager, Gary (Ind.) branch; William H. Compton, manager, Rockford (Ill.) sales office for the past four years, supervisor of standard-motor sales with headquarters at Cleveland; Emory G. Orohood, from Birmingham, Ala., to the Atlanta (Ga.) sales office; Robert B. Reed, from Gary, Ind., to Birming-



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Among other outstanding features, WILFLEY provides complete interchangeability of parts—from metal to rubber, or rubber to metal. This is only one of many WILFLEY improvements that create cost-reducing efficiency, stepped-up production, worthwhile power savings and complete dependability. In addition to rubber, WILFLEY wear parts are available in electric furnace iron and other materials individually engineered for every application. An economical size for every purpose. Write or wire for complete details.

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For record-breaking performance... for ease of operation, you can't top a McCarthy Vertical Drill. Recently, on one difficult job, workers using McCarthy equipment drilled an 8-inch hole 100 feet deep in only 40 minutes! The derrick is raised and lowered by hydraulic power... finger tip controlled... and a 60 H. P. gasoline motor is part of the standard equipment.

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**MINING EQUIPMENT  
SINCE 1901**



**THE SALEM TOOL COMPANY**

ham; and John Drollinger as sales engineer in Detroit.

**Rome Cable Co.**, Rome, N. Y., has appointed G. F. Lipacomb, formerly associated with the Joy Mfg. Co., a mining-cable specialist in the West Virginia-Virginia-Kentucky coal fields, with headquarters at the company's Pittsburgh, Pa., office.

**Ohio Brass Co.**, Mansfield, Ohio, has announced three changes in its organization, as follows: Merrill W. Manz, formerly general factory manager, has been made a vice president. Roger A. Black, manager, foreign trade department, has been named to succeed Mr. Manz, and H. E. Shoemaker, formerly assistant manager, has been appointed manager, foreign trade department.

**U. S. Rubber Co.**, New York, has appointed Matthew J. Delehaunty, formerly a member of the Pittsburgh, Pa., sales staff, district sales manager for the Pittsburgh branch of its mechanical goods division.

**American Steel & Wire Co.**, Chicago, has appointed Edward A. Murray manager, Chicago district sales office, succeeding Clarence T. Gilchrist. Mr. Murray is succeeded as manager of manufacturers products sales in Chicago by Fred L. Nonnenmacher, previously in the same position in the New York sales office.

**Allis-Chalmers Mfg. Co.**, Milwaukee, has named J. F. Fitzsimmons manager of its commercial research department, succeeding J. R. Reed, who has resigned to establish his own business. Mr. Fitzsimmons formerly was supervisor of the department's research section.

**B. F. Goodrich Co.**, Akron, Ohio, has appointed E. R. Traxler manager of the company's new flat-belt engineering and developing department. Mr. Traxler has been associated with the company since 1935 in product development work.

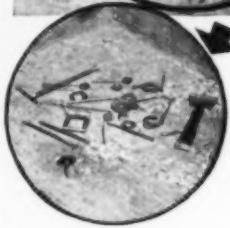
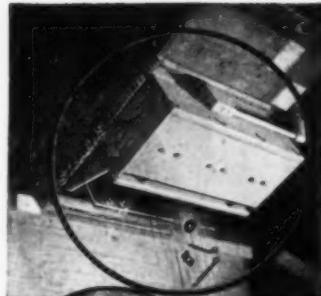
#### Trade Literature

Available Without Charge on Request to the Manufacturer

**JUNIOR SAFETY LAMP**—Mine Safety Appliance Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. Bulletin BJ-4 illustrates and describes the new M.S.A-Wolf Junior safety lamp, lighter and smaller than standard models.

**CONVEYORS**—Hapman Conveyors, Inc., Detroit 21, Mich. Catalog 5000 illustrates and describes Hapman rubber-flight sealed-pin conveyors for handling any material, including abrasives. Included are engineering drawings of typical systems for coal and other materials, and pictures and sketches of applications to sludge tanks and other equipment.

**HARDFACING**—Stoody Co., Whittier, Calif. Revised "Stoody Guidebook" describes approximately 100 common uses



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JUST FOUR HOURS of operation recovered this amazing amount of tramp iron at the Fleischmann Malting Company with a Stearns Electro-Magnetic Spout Type Separator. Protect your machinery, avert possible shut-downs and costly repairs — remove all the tramp iron with a Stearns separator.

Tramp iron is automatically discharged by simply opening and closing the control switch. No time is lost, no hand scraping.

For continuous maximum magnetic strength, select a Stearns separator. No tramp iron can escape their deep, strong field. Low initial and operating costs.

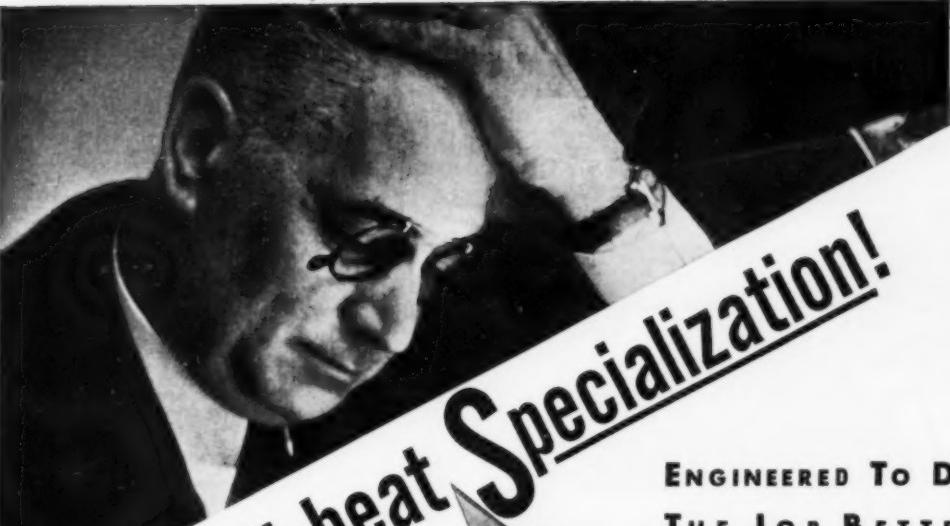
For complete specifications and operating data on Stearns Electro and Permanent Magnetic Spout Type Separators, write for bulletins.

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PULLEYS • BRAKES • DRUMS  
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Duff-Norton Mine Roof Jacks . . . jack fittings . . . angle jacks and pin timbering jacks are your best choice for all mine roof supporting jobs. Their sturdy construction combines safety and dependability with economy. To specify the *right jacks* for your needs . . .

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MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA.—CANADIAN PLANT, TORONTO, ONT.

"The House that Jacks Built"

for hard metals, with data on choice, application and approximate amounts required.

**PIPE**—L. B. Foster Co., Pittsburgh 36, Pa. New folder on "Pipe and Pipe Fabrication" provides complete information on sizes, prices, weights and dimensions, the advantages and extra services available when buying new-tested, hydraulic, double-extra-heavy, light-weight tubing and spiral-welded pipe from Foster's five warehouses, plus additional data on Foster rails, track accessories, steel-sheet piling and wire rope.

**SERVICE AWARDS**—Irons & Russell Co., Providence 3, R. I. Booklet entitled "Service Awards—Case Histories" summarizes results of a survey to determine employer experience with service awards.

**TURBINE PUMPS**—Johnston Pump Co., Los Angeles 11, Calif. Bulletin 1013, oil-lubricated pumps, and Bulletin 1014, water-lubricated pumps, detail design, parts interchangeability and operation, including special impellers for each pumping service.

**ENCLOSED SWITCHES**—Trumbull Electric Mfg. Co., Plainville, Conn. Brochure TEC-1 presents the features of the newly developed Type D front-operated enclosed switch for residential, commercial and farm applications, including capacities and ratings.

**MINING MACHINERY AND EQUIPMENT**—Goodman Mfg. Co., Halsted St. & 48th Place, Chicago 9. Several bulletins recently announced as available offer descriptions and illustrations of the construction, features and application of various Goodman products, as follows: belt conveyors and accessories, Bulletin CC-193; Types 274 and 374 cable-reel shuttle cars, Bulletin CLTS-495; L-20 shaker-conveyor drive, Bulletin CC-494; shortwall coal cutters, Bulletin CM-62; and Type 660 tractor-tread loader, Bulletin CLT-496.

**BATTERY SELECTION**—Gould Storage Battery Corp., Trenton, N. J. Battery Selector Bulletin GH-1053 announces the new "Z" plate, includes exploded drawings of the "Thirty" and "Kathanoide" batteries, describes the new "Televel" and a battery-element support permitting a lower sediment chamber, and gives engineering specifications for almost 100 batteries of different sizes and capacities to assist in proper selection.

**VALVES**—Kennedy Valve Mfg. Co., Elmira, N. Y. Circular 191 features the Kennedy bronze globe and angle valves for services up to 150 lb steam or 300 lb cold water, oil, air or gas, with available sizes and dimensions.

**EXPLOSIVES**—Illinois Powder Mfg. Co., St. Louis, Mo. New 46-p explosives handbook presents detailed information on the characteristics of various types of explosives, together with a table of "Explosives Recommended Under Average Conditions" and a reference guide to assist in determining quantities in specific applications.

**UNIT WASHERY**—McNally-Pittsburgh Mfg. Corp., Pittsburgh, Kan. Coal Cleaning Bulletin No. 446 describes a unit-type Baum-Jik washery designed for small-tonnage operations and including a washer, settling tank and recirculating water system. Ready-built, it is delivered complete for assembly. The washery is a small edition of the company's standard job and is available in four different sizes for four different basic washing circuits, 30 to 300 tph, 5 in to zero.

**SILICONE GREASES**—Dow Corning Corp., Midland, Mich. Silicone Notes No. D-5 on "Dow Corning Silicone Greases" outlines the properties, performance and uses of these heat-stable and oxidation-resistant silicone lubricants recommended for temperatures up to 400 deg F. Silicone Notes No. D-6 contains information on "How to Use

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KING STRIP  
DETONITE  
get Better  
Overburden  
Breakage**



• Detonite, the patented, surface-sensitized stripping explosive, is especially designed to shoot overburden with maximum economy. Detonite is slow-acting. It has a heaving, spreading action that lifts and fully displaces the burden without killing the coal. Detonite's more efficient fragmentation relieves the shovel; permits you to move more yardage, faster, at less cost.

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DETONITE'S MANY ADVANTAGES**

• We will be glad to demonstrate Detonite on your property, under your actual operating conditions, at your request. See your King representative, or phone or write us direct. Why not profit by arranging that demonstration date today?

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### VIBRATING GRIZZLIES

Bypassing fines ahead of crushers, picking tables, screens, etc. Laying a protective cushion of fines on belts against damage from heavy, abrasive chunks.



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Dewatering fine coal sludge. Removing silt from sand flotation processes, etc.

Variable control of flow.

Since all movement is confined to leaf springs, there are no mechanical wearing parts, such as motors, gears, belts, pulleys, cams, bearings, etc., to maintain and replace.

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### SCREENING FEEDERS

Sizing end product for customer satisfaction. Bypassing fines ahead of washer.

They feed as they screen.



DC 44 Silicone Grease in the Bearings of Electric Motors. It includes instructions for lubricating open and single-shielded ball bearings and discusses the use of double-shielded and cartridge-type ball bearings prelubricated for life.

**AC DRIVE**—The Louis Allis Co., Milwaukee, Wis. Bulletin 611-D describes the company's Adjusto-Spede variable-speed ac drive, with engineering data and application suggestions.

**SCALES**—Richardson Scale Co., Clifton, N. J. Latest model automatic bulk weighing machines described in Bulletin 1549, the belt-fed "Class 39" scale, and Bulletin 1449, the "Class 40" scale designed for optional methods of feed—belt, screw or vibrating feeder. Each bulletin lists applications and gives engineering data.

**STEEL APPLICATIONS**—United States Steel Corp., New York. Technical movie, "An Orchid to Mr. Jordan," illustrates many of the present-day applications of stainless steel. Running 25 min., the movie is available in 16- and 35-mm sound versions through film distribution centers in Birmingham, Chicago, Cleveland, New York, Pittsburgh and San Francisco.

**FLOTATION PROCESS**—Denver Equipment Co., Dept. 3, 1400 17th St., Denver 17, Colo. Bulletin FLO-B29 discusses in detail the theory, application and results of the Denver "Sub-A" froth-flootation process for the treatment of coal fines and other materials.

**FACE SHIELDS**—Mine Safety Appliances Co., Braddock, Thomas & Greene Sts., Pittsburgh 8, Pa. Bulletin CN-3 describes MSA face shields available in three standard headgear types for protection in handling acids and other chemicals, pouring hot metal, sanding, grinding, degreasing and other operations where face and eyes are endangered by light flying particles.

**SAFETY EQUIPMENT**—E. D. Bullard Co., 275 8th St., San Francisco 3, 1949-50 issue of "Everything in Safety," the company's complete catalog, covers personal protective equipment and industrial safety devices and is divided into five sections: first aid; respiratory protection; eye protection; hats, belts and clothing; and miscellaneous equipment.

**INSTRUMENTS**—H-B Instrument Co., 2623 Trenton Ave., Philadelphia 25. Catalog 15 is a detailed guide for selection of a wide range of instruments for plant and laboratory, including various types of thermometers, psychrometers, thermo-regulators, mercury-plunger relays, hydrometers and scales.

**SAFETY SWITCHES**—Trumbull Electric Mfg. Co., Plainville, Conn. Bulletin TEC 302A covers construction, ratings, features and applications of Trumbull Type A-Style A heavy-duty industrial safety switches.

**FLEXIBLE-CHAIN COUPLINGS**—Morse Chain Co., 7601 Central, Detroit 8, Mich. Catalog C45-49 offers dimensions, ratings, specifications, etc., for roller-chain stock couplings; silent-chain stock couplings; heavy-duty made-to-order silent-chain couplings; and steel and plastic coverings for the two stock couplings.

**PRESSURE REGULATORS**—Air Reduction Sales Co., 60 E. 42nd St., New York 17. Catalog covers the company's complete line of pressure regulators, including regulators for welding, cutting, special flame processes, administering anesthetic gases, maintaining gaseous pressure in electrical equipment and other operations.

**ROLLER CHAIN**—Atlas Chain & Mfg. Co., Castor & Kensington Aves., Philadelphia 24. Bulletin offers construction and application features, dimensions and prices for Atlas single and multiple roller chain, chain attachments and cable chain.

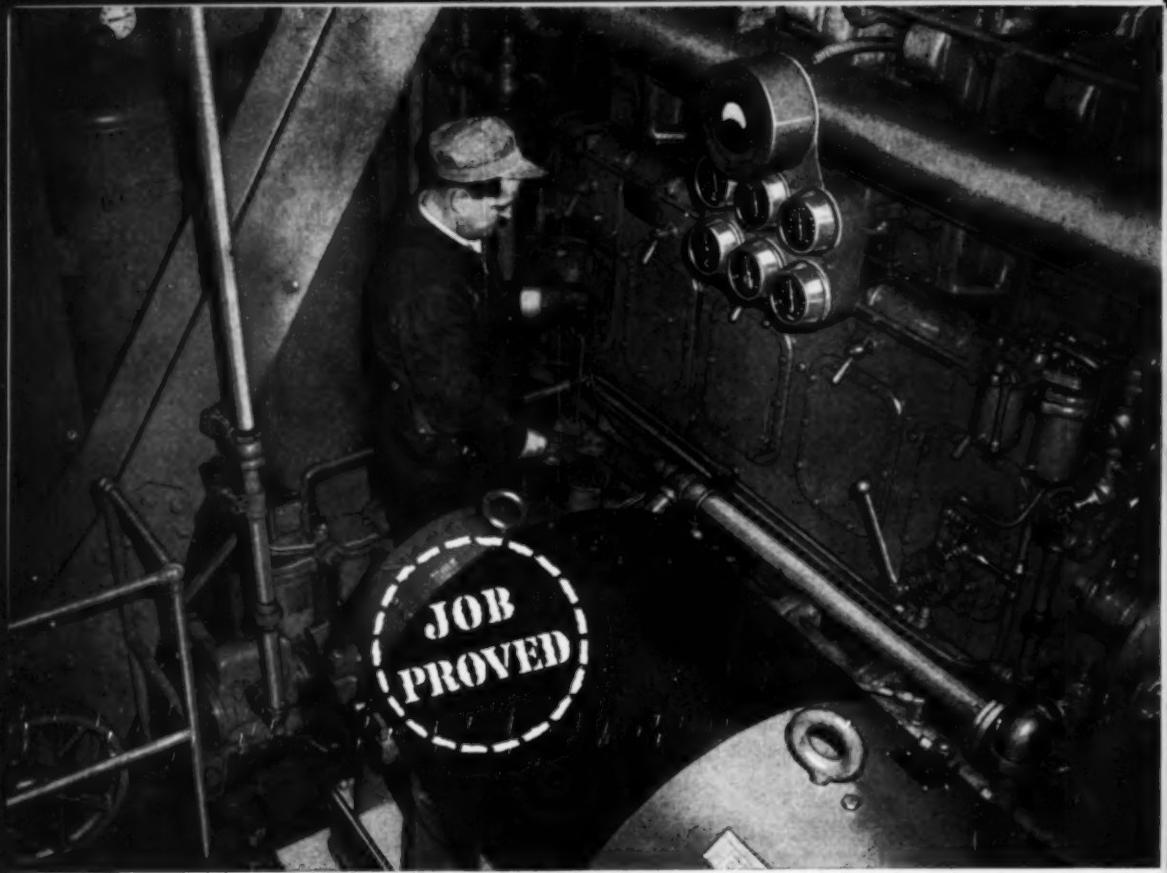


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# News Round-Up



## UMWA Monopoly Aired at Senate Committee Hearings

A BLEAK PICTURE of the effects of union-labor monopolistic power and practices on the coal industry and the nation's economy emerged from the testimony of coal industry representatives and others who appeared before the Senate Banking and Currency Committee at hearings beginning July 25.

In announcing plans for the hearings, Sen. A. Willis Robertson (D., Va.), who originally initiated the investigation, stated: "The Committee will seek to find out the extent of power which industry-wide labor organizations have acquired, the manner in which this power is being exercised, the effects on banking and credit policies, small business enterprises, consumers, prices and national economic stabilization of the economic power of unions in the coal industry and in industry generally.

"The necessity for this investigation was originally suggested by the report that a single individual would be authorized to speak for the coal industry in contract negotiations and that he, with single representative of labor in the industry, could determine not only wage but also production levels. The 'stabilization' strikes, the current three-day week imposed on the coal industry by the UMWA, the threatened strikes in steel and the continued tie-up of shipping in Hawaii are all recent developments which re-emphasize the need for such an investigation."

Witnesses at the opening sessions

of the hearing were George Love, president, Pittsburgh Consolidation Coal Co.; Harry M. Moses, president, H. C. Frick Coke Co.; and John D. Battle, NCA executive vice president. Both Mr. Love and Mr. Moses denied that any attempt was being made to appoint a "czar" in the bituminous

industry but said that a move was contemplated "to select a spokesman to represent those operators in the coal industry desiring to carry on negotiations on labor matters with representatives of employees." Mr. Love said that the matter was still under discussion.

In their talks, both Mr. Love and Mr. Moses pointed out that operators are forced to bargain in effect on a national basis with the union and that if any of the three segments of the industry carrying on contract talks should make a contract with the union



AS SENATE BANKING COMMITTEE COAL INQUIRY OPENS, Sen. Burnet R. Maybank (D., S. C., left), Sen. Homer Capehart (R., Ind.), and Sen. A. Willis Robertson (D., Va.), who requested the hearings, confer with George H. Love, president, Pittsburgh Consolidation Coal Co., and Harry M. Moses, president, H. C. Frick Coke Co.



THIS MONTH'S COVER—View from the cab of the 25-yd dragline at P. & R. C. & I.'s Beechwood striping, Minersville, Pa., where the contractor, Correale Construction Co., is stripping up to 400 ft of overburden. The coal seam averages 80 to 90 ft. with a roll resulting in a 200-ft seam in spots.

### COMING IN THE OCTOBER COAL AGE

- HOW TO CUT COAL-MINING COSTS—Major cost-cutting opportunities in coal mining and how they can be realized.
- HOW LUCERNE PREPARES A QUALITY PRODUCT—Rochester & Pittsburgh's newest plant

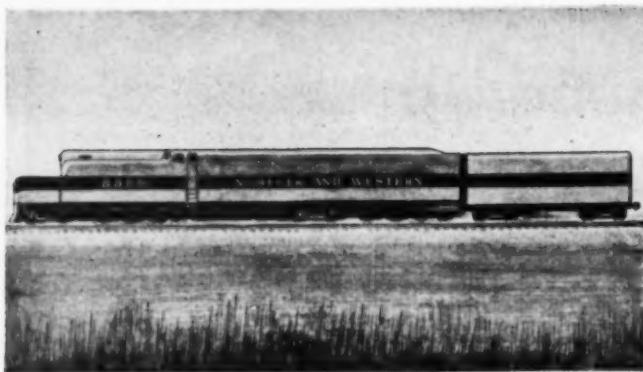
and how it achieves quality preparation by washing, tabling, filtering and heat-drying.

● ANTHRACITE STRIPPING—Trends in practice and equipment.

● HOW METALIZING HELPS MAINTENANCE—Equipment, methods and results in cutting costs.

● PRODUCTIVITY THE KEYNOTE IN HENDERSON RUN DESIGN—How forethought and systematic development and operation result in high tons per man at new mine.

● EFFICIENCY IN STOCKPILING—Wildwood installation facilitates storing, reclaiming and rescreening both large and small sizes.



## Norfolk & Western Ry. Orders New-Type Coal Locomotive

THIS NEW TYPE of coal-burning steam-turbine electric-drive locomotive recently ordered by the Norfolk & Western Ry. Co. is designed to use exceptionally high boiler pressures combined with efficiencies inherent in the steam-turbine electric drive to produce an over-all thermal efficiency expected to cut fuel costs to one-half those of the conventional reciprocating steam locomotive. Planned for freight-service operation, the locomotive will be rated at 4,500 hp and with its 16,000-gal-capacity water-carrying tender will have an over-all length of 148 ft. The unit will weigh approximately 952,000 lb and will carry 20 tons of coal in the nose ahead of the operator's cab. The water-tube-type boiler will produce a steam pressure of 600 psi, about double that of the conventional steam-locomotive boiler. The new unit is to be constructed by The Baldwin Locomotive Works, in collaboration with the Westinghouse Electric Corp. and Babcock & Wilcox Co.

that contract would be forced on the rest of the industry. Both witnesses outlined the effects on the industry of the three-day week and Mr. Love called it "a confiscation of a large part of the capital invested" in various mining facilities and tools that the progressive mine operator finds necessary to reduce the cost of coal to consumers. During questioning by the senators, both Mr. Love and Mr. Moses denied that there had been any collusion with John L. Lewis to stabilize the production and price situation in the coal industry and emphatically stated that the three-day week had been forced on the industry by Mr. Lewis alone. They reported that the increase in the cost of mining as a result was ranging from 25 to 75¢ per ton in various mines and that the industry is losing its markets to other fuels and energy sources.

Among the non-industry witnesses who appeared before the committee was Thurman Arnold, formerly head of the anti-trust division, Department of Justice. In stressing the fact that unions presently can combine with or without employers to restrict production and accomplish other results forbidden by the anti-trust laws, Mr. Arnold said: "I think that wages and hours is a legitimate union activity, anything that concerns wages and hours. When, however, this wages and hours becomes used as a pretext to restrict production and achieve control over management and production, it then falls, or should fall, upon the

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prohibitions of the Sherman Act as an illegitimate activity of labor."

Donald Richberg, former NRA administrator, was quoted in part: "It is sheer hypocrisy to demand the destruction by government of monopolies developed and controlled by business managers and at the same time to demand the protection by government of monopolies developed and controlled by labor managers." Mr. Richberg's statement, made before another congressional committee, was inserted into the record by Joseph E. Moody, president, Southern Coal Producers' Association, who also testified. Tyre Taylor, general counsel Southern States Industrial Council, appearing before the committee, said: "For all practical purposes, the UMWA exercises total control over coal production in this country."

Another witness, Theodore R. Iserman, New York attorney, stated: "Up to 1935, our laws merely granted immunity to monopolies of labor. Since

then, the laws have created monopolies, have extended them, and have provided machinery for maintaining them and enforcing their powers. . . . We have dozens of agencies to control evil practices in business and none at all to control evil practices in labor unions and I think we ought to have them." George B. Christensen, Chicago attorney, told the committee: "All this (evils of labor monopolism) could be averted by removing the unions' special exemption from antitrust laws and amending our antitrust laws to permit unions that same degree of integration within an industry which the industry itself is allowed."

The coal-industry representatives who testified before the committee covered many phases of labor monopoly in the industry, including such subjects as the effect of the three-day week, loss of markets, increasing costs, unstable labor conditions, and strife and violence in some sections as a result of labor activity. Among those appearing to give the industry's side of the picture were: L. C. Gunter, president, Southern Appalachian Coal Operators' Association; Rolla D. Campbell, general counsel, Island Creek Coal Co.; Jesse V. Sullivan, executive secretary, West Virginia Coal Association; Justin Potter, president, National Coal Co.; A. R. Long, president, Brookside-Pratt Mining Co.; J. Atlee Schaefer, president, American Retail Coal Association; A. W. Dickinson, American Mining Congress; and Walter R. Thurmond, secretary, Southern Coal Producers' Association. Miss Josephine Roche, director, UMWA Health and Welfare Fund, reported in detail on the fund's activities (see page 152). Ezra Van Horn, fund trustee representing the operators, was scheduled to appear before the group Aug. 26 and, unless other witnesses asked to be heard, the hearings were expected to end after Mr. Van Horn's appearance.

Meanwhile, the mines continued on the three-day schedule, with resumption of contract negotiations set for Sept. 15. Following sessions July 26 and 27, the conference at White Sulphur Springs was adjourned until Aug. 11. Meetings were held on Aug. 11 and 12 and then adjourned until Aug. 23. At both meetings, the operators offered to continue the 1948-49 contract in effect until March 31, 1951, maintaining that in view of present market conditions and the decline in the cost of living the miners would profit from the present high wages. On the second day of the resumed conference, Aug. 24, the session was adjourned until Sept. 15, with the Bluefield talks scheduled to resume the previous day. Bituminous production on the three-day week was running around 7½ million tons a week at the first of August, reaching a high of 8,000,000 during the week ending Aug. 13.

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Leonard Busiere (left), mine manager; John Vaught, Linsey Boroff, Ray McCarty, Charles Garrison, George James, August Lindsay and Thomas Scroggins, section foremen, Green Valley mine, Snow Hill Coal Corp., Terre Haute, Ind.



Giles W. Vincent, tipple foreman, Casey Creek Mining Co., Greenville, Ky.

## COAL MEN



Sterling Gothard, electrician, and Dralus Pierce, Lake Creek mine manager, Consolidated Coal Co., Johnston City, Ill.



W. A. Gothard (left), Lake Creek superintendent, Consolidated Coal Co., and Earl Bradley, Joy Mfg. Co., Johnston City, Ill.



G. N. Ranney (left), chief engineer, and Hilary Hurst, corporation secretary, 20th Century Coal Co., Beaver Dam, Ky.



Charles A. Osborne, chief electrician, Sunlight Coal Co., Boonville, Ind.



J. D. Roach, chemist, Broken Arc Coal Co.,  
Okmulgee, Okla.



Howard Ray (left), truck boss; William Harlan, lampman; Bill Williams, shop foreman; John Kuhn, chief welder; Horace Taylor, electrician; and Ostell Bullock, superintendent, Caney Creek Mining Co., Greenville, Ky.

## ON THE JOB



L. H. Carr (left), master mechanic, and W. W. Powell, chief  
electrician, 20th Century Coal Co., Beaver Dam, Ky.



Hugh Carmak (left), dragline operator, and O. L. McClellan, pit  
foreman, Evans Coal Co., Spiro, Okla.



W. J. Jenkins II, mechanical engineer, Con-  
solidated Coal Co., Johnston City, Ill.



C. E. Mattox (left), superintendent; H. A. DeMoss, assistant superintendent; and Otis D.  
English, billing clerk, Sooner Coal Mining Co., Oologah, Okla.

## Personal Notes



J. H. REITZ

J. H. Reitz has been named manager, Northern Coal Mine District, Republic Steel Corp., Uniontown, Pa., succeeding James L. Hamilton, who last month was made vice president (operations), Island Creek Coal Co. Mr. Reitz formerly was assistant manager of Republic's northern district. He will be in charge of coal-mining operations at 10 of the corporation's mines in western Pennsylvania, West Virginia and Kentucky. Mr. Reitz's earlier positions with Republic Steel Corp. include service as assistant superintendent of the Russellton (Pa.) mine, superintendent of Crescent No. 2 mine at Charleroi, Pa., and superintendent of industrial relations for the northern district. He was made assistant manager of the district in 1947.

Charles W. Conner, manager, Mining Division, Armco Steel Corp., Montcoal, W. Va., retired July 1 from active management of the division, according to an announcement by L. F. Reinartz, assistant vice president of the company. Mr. Conner will continue to serve the division on a consulting basis for some time to come. C. O. Kane, production supervisor for the division, has been named general superintendent, with responsibility for all departments except coal sales and personnel relations. Mr. Kane joined Armco Feb. 1, 1943, as general mine foreman, Montcoal No. 1 mine, was made superintendent of the Nellis mine Oct. 1, 1945, and production supervisor Jan. 1, 1948. Samuel F. Carter, maintenance supervisor, Nellis mine, and associated with the company since 1934 in various maintenance supervisory positions, has been appointed superintendent of maintenance for the division. Howard Holtzclaw, sales manager, Colcord Coal Sales Co., will report to Mr. Reinartz under the new organizational set-up. J. S. Chapman, assistant to

the manager of the mining division in charge of personnel and public relations, will continue in that capacity, also reporting to Mr. Reinartz.

George M. Dickens, formerly superintendent, Red Ray mine, United Electric Coal Cos., closed this spring, has been temporarily transferred to the company's Buckheart mine, Canton, Ill., where he will supervise coal loading on river barges.

J. W. Irwin, chief electrician, Kehler mine, Colorado Fuel & Iron Corp., Tioga, Colo., has been named chief electrician for the company's mining department, succeeding J. R. MacDougall, who recently retired after 50 years of service with C. F. & I. Mr. MacDougall was honored Aug. 6 at a farewell party at the Trinidad, Colo., Country Club attended by more than 75 fellow mine officials. He first joined the company in 1899 at the age of 13 as a roustabout, earning 10¢ an hour. He became interested in and studied electrical work and was appointed electrician at the company's Primero mine when he was 18. After holding supervisory posts at various operations, he was named chief electrician in 1932. Mr. MacDougall and his wife will continue to make their home in Trinidad.

E. L. Clair has been elected president of the Olga Coal Co., Cleveland, Ohio. H. Eugene Mauck, who recently joined the company as assistant to the president (*Coal Age*, February, p 154), has been named general superintendent for the company.

Robert M. Fleming, general manager, Ebensburg Coal Co., Colver, Pa., retired Sept. 1, after many years in the coal industry. Mr. Fleming is succeeded by Thomas L. Aitken.

Donald M. Given Jr., formerly research engineer, Fuels Division, Battelle Memorial Institute, Columbus, Ohio, has joined the Fairmont Coal Bureau, New York, as fuel engineer to work on better engineering for small steam plants.

John Childers has been promoted from safety department inspector, Consolidation Coal Co. (Ky.), to mine foreman, Mine No. 214, McRoberts, Ky.

## Obituaries

John T. Wilson, 71, president and treasurer, Winco Block Coal Co., died Aug. 11 at his home in Bluefield, W. Va., following an illness of several months. Mr. Wilson came to Bramwell in 1902, joining the Pocahontas Land Co. as a rodman, a short time later becoming an engineer. He was active in the formation and management of several coal companies, in-

cluding the Dry Fork Collieries Co., Warrior Coal Co., Rocky Branch Coal Co. and Cardiff Coal Co. He organized the Winco Block Coal Co. in 1921.

John E. Reilly, 78, president, Duncan-Spangler Coal Co., Spangler, Pa., died Aug. 2. Mr. Reilly had been active in the northern Cambria coal area of Pennsylvania for a number of years.

William J. Richards, 86, president of the Philadelphia & Reading Coal & Iron Co. from 1914 until he retired in 1927, died Aug. 17 at his home in Pottsville, Pa., following a long illness. Mr. Richards entered the coal industry in 1882, joining P. & R. the following year. He left the company in 1888, rejoining it in 1903. He also had bituminous interests in West Virginia and at one time was associated with the Mineral R.R. & Mining Co. and the Lehigh & Wilkes-Barre Coal Co.

## New Developments

• William J. Raeder, Dunmore, Pa., regional representative of the Austin Powder Co., was appointed Aug. 16 trustee of the Jermyn-Green Coal Co., Pittston, Pa., which filed a petition for bankruptcy July 13 (*Coal Age*, August, p 122). Mr. Raeder, who is expected to begin liquidation immediately, is president of the Scranton Chamber of Commerce and a former resident of Wilkes-Barre.

• Lease of some 1,800 acres of coal lands from the Olga Steel Co. was announced early last month by Dr. Huston St. Clair, president, Jewell Ridge Coal Corp., Tazewell, Va. The property is adjacent to the Jewell Ridge No. 1 mine and is expected to add 20 years to the life of that mine and increase its daily output from 5,000 to 6,000 tons. Development was already under way, it was reported, and actual production was expected in September. Coal from the property will be shipped from the No. 1 tipple and some 200 men will be added to the payroll when development is completed.

• Reopening of the St. Ellen Mine, Perry Coal Co., O'Fallon, Ill., was expected early in August. The mine had been down since July 2 when a fire in surface storage bins caused damage estimated at \$100,000. With the reopening of the mine, coal was reportedly to be brought up the new 664-ft belt slope recently completed (*Coal Age*, June, p 88).

• The Taylor No. 5 mine of the Franklin County Coal Co., Herrin, Ill., closed since April 30, was reportedly reopened Aug. 8. The operation, which formerly employed 390 men, will work two shifts and have a working force



ESCO 4½-yard coal loading dipper on model 1055 P&H machine, loading coal in pit of Twentieth Century Coal Company, Beaver Dam, Kentucky

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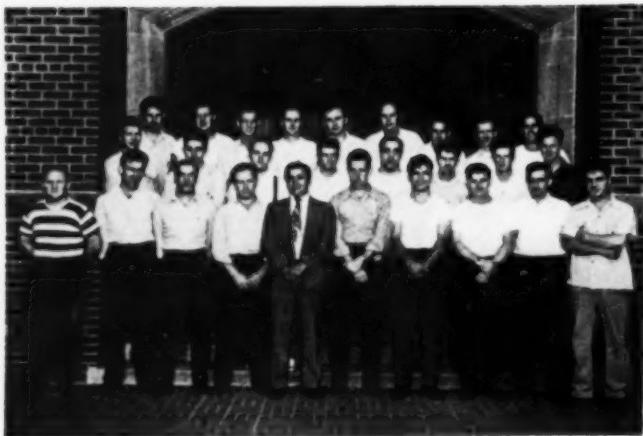
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### First Graduates of Three-Year Summer Mine Course

CERTIFICATES OF COMPLETION of the three-year summer course in mining operation at St. Francis College, Loretto, Pa., were presented to these 27 miners and supervisory officials, and two others not shown, at ceremonies held at the college Aug. 5. The group was the first class to complete the three-year training, which was established in 1947 through the efforts of the Central Pennsylvania Coal Operators' Association. The men receive full pay from their companies while attending the school, which is said to be the only one of its kind in the country. Some 80% of those graduating this year have been upgraded and many also have become foremen and assistants, since attending the school.

of about 200 men, Marion Winkler, superintendent, reported.

\* The Valier, Ill., mine of the Valier Coal Co., subsidiary of the Chicago, Burlington & Quincy R.R. Co., was to be closed indefinitely Aug. 10 according to reports. Output of the mine, which has been employing 650 men and producing 6,300 tons daily, is used exclusively for the railroad and has been more than it required at present, it was said.

\* The Diamond Coal Mining Co., Knoxville, Tenn., reportedly has purchased the Pine Mountain mine of the Fourseam Coal Co., Bramwell, W. Va. The sale also included some 6,000 acres of coal lands in the Leatherwood area, it was said.

\* Red Ash Pocahontas Coal Co., Cincinnati, Ohio, recently announced the purchase of the Norton Coal Co., Norton, Va., and has named W. A. Thompson as manager. In recent years, Norton Coal Co. has not engaged in mining operations but has operated coke ovens, 92 of which were in operation at the time of the sale. Extensions and increases in plant capacity reportedly are being planned. Earlier, in 1948, Red Ash Pocahontas Coal Co. had bought the 50 coke ovens of Hawthorne Coal Co., also at Norton, Va.

\* Gladeville Coal Co., a newly organized corporation with Harry Turner, Norton, Va., as president, has purchased the plant of the Peerless Coal Co., Glamorgan, Va. The new owners

are reported to be planning expanded operations in new coal lands near by.

\* Sunday Creek Coal Co., Nelsonville, Ohio, is reported to have completed construction of a new coal-loading tipple at Hudson, Ohio, Aug. 1. The new loading facility, on the banks of the Ohio River, was planned for a capacity of three barges a day. A similar unit is approaching completion near Middleport, Ohio.

### MEETINGS

- AIME: mid-year meeting, Sept. 25-Oct. 1, Columbus, Ohio.
- ASME: fall meeting, Sept. 28-30 Lawrence Hotel, Erie, Pa.
- National Coal Association: annual convention, Oct. 5-7, Waldorf-Astoria Hotel, New York City.
- National Safety Council: Coal Mining Section, 37th National Safety Congress and Exposition, Oct. 24-26, Stevens Hotel, Chicago.
- Coal Division, AIME, and Fuels Division, ASME: joint meeting, Oct. 26-27, French Lick Springs Hotel, French Lick, Ind.
- Illinois Mining Institute: 57th annual meeting, Oct. 28, Hotel Abraham Lincoln, Springfield, Ill.
- West Virginia Coal Mining Institute and Central Appalachian Section, AIME: joint meeting, Nov. 11-12, Summit Hotel, Uniontown, Pa.

\* Bastin Coal Co., Kona, Ky., is preparing a new modern truck mine on the Kentucky-Virginia highway near Seco, Ky. The mine will work the Elkhorn seam, loading being done from a ramp at Kona to the main line of the L. & N. R. R.

\* The Wennebrog Coal Co., Sherman, Ill., was reported to have started operations Aug. 1 after three months of idleness. With use of modernized equipment, the mine is expected to produce about 500 tons per day. The company has asked that all 60 employees, members of the PWMA, return to work. Preliminary work was started July 27.

### Lehigh Navigation Fetes 50-Year "Old Timers"

More than 280 members of the Old Timers' Club of the Lehigh Navigation Coal Co., Lansford, Pa., got together Aug. 6 for the seventh annual outing, held at the company's grove on the shores of Greenwood Lake nearby. All veterans of 50 years or more with Lehigh Navigation—a membership requirement of what the company calls "The World's Most Exclusive Club"—the men, some retired and others still employed, spent the day in reminiscing, renewing old acquaintanceships and enjoying the music, food and refreshments supplied by the company.

Top officials of the company were in attendance, including Evan Evans, president, and Robert V. White, president, Lehigh Coal & Navigation Co. During the day 28 new members were received into the club and were presented with pins by President Evans. Harry Shires, with 69 years' service, took a bow for the longest period of continuous employment. Among others with long service records were: James Cullen and John Amberg, still working after 63 years with the company; W. W. Bobst, 68 years, and his son, Robert 51 years, both on the firm's pension list; the three Hartneady brothers, Patrick, Charles and John, with a combined total of 163 years; and the three Evans brothers, Harry, Bill and Thomas, each with 54 years' service.

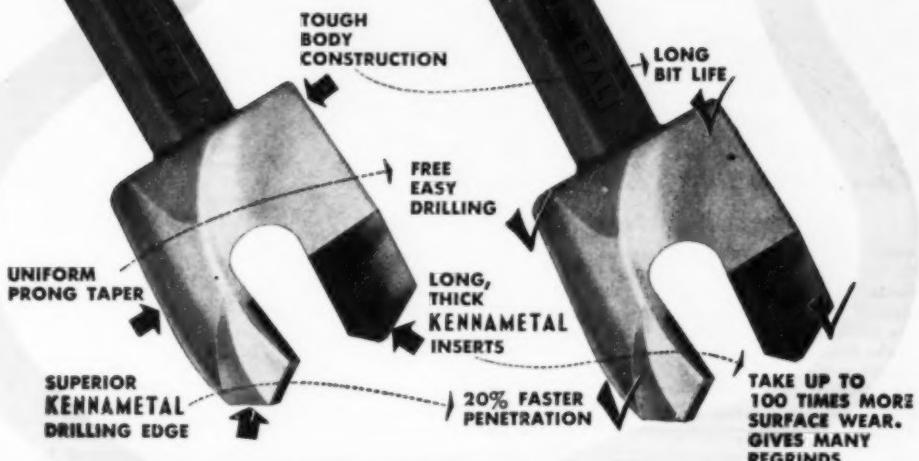
Music was provided by Prof. William "Pop" Miller's Coaldale Victory Band, assisted by the company's own Anthracite Octet and J. Henry Morgan, well-known Scranton tenor.

### Stream Pollution Ending In Anthracite Region

Stream pollution from Pennsylvania's anthracite collieries has reached the beginning of the end, with clear water entering the Schuylkill River for the first time in more than 50 years, it was reported last month.

Desilting basins installed at 47 collieries in the Schuylkill watershed

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### Winding Gulf Holds Annual Safety Banquet

AMONG THOSE ATTENDING the annual safety banquet of the Winding Gulf Collieries Co. held for the supervisory officials of Herndon, Lamar and Goodwill mines and their families July 16, at the Town Club, Bluefield, W. Va., were: E. V. Bowman (left), chief engineer; Mrs. Bowman; Mrs. Edgar A. Stanley; Mr. Stanley, safety director; E. E. Jones, vice president and general manager; Joe Herndon, general manager of stores; Mrs. Charles Gillespie; and Mr. Gillespie, superintendent, Herndon and Lamar mines. Mr. Stanley presided at the banquet, given annually to encourage leadership and safety in mining at the company's operations, introducing Mr. Jones, who emphasized the need for safe-thinking supervisory personnel. Safety bonuses were distributed at the close of the meeting.

by order of the state Sanitary Water Board are preventing an estimated 2,000,000 tons of fines entering the streams a year. Permits for desilting systems have been issued to 114 collieries in the Susquehanna Basin and most of them are in operation, according to Dr. Norris W. Vaux, board chairman and state health secretary. Others are under construction and plans for the remaining 22 are being drafted. Three collieries in the Lehigh Basin have systems in operation, three are preparing plans and the remaining three do not require them. Dredging enterprises are "fast fading" along Pennsylvania streams and many dredges have abandoned operations, Dr. Vaux reported.

### Coal-Heat Preference Down in Philadelphia

Both the number of Philadelphia homes heated by coal and the Philadelphia families who would prefer to have their homes heated by coal declined in 1949 as compared with 1948, according to its 1949 Consumer Analysis of the Philadelphia Market recently released by the Philadelphia Bulletin. The study, which is the fourth city investigation of buying habits and preferences compiled by the newspaper, covered 4,279 families in the city proper and 2,536 families in the suburbs and included comparative figures on the home heating of city families for 1947 and 1948.

According to the survey, 52.9% of the city families questioned had their homes heated by coal in 1949, 57.0% in 1948 and 65.8% in 1947. Suburban families using coal totaled 49.3% in 1949, the only year for which suburban figures are available. Percentages for city families heating with oil for 1947, 1948 and 1949 were 21.0, 32.1 and 33.9, respectively; and for gas, 5.3, 5.6 and 8.6. Of the suburban families, 42.7% used oil in 1949 and 5.5% gas.

In reply to the question, "How would you prefer to have your home heated," city families voted for coal as follows: 1947, 14.4%; 1948, 22.4%; and 1949, 19.4%. For oil, the preference was 42.4%, 36.3% and 44.1%, in the same order. For gas, it was 41.5%, 38.8% and 34.5%. Suburban preferences in 1949 were: coal, 20.1%; oil, 57.6%; and gas, 20.7%.

### Coal Fatalities Down In First Half of 1949

Fatal accidents in bituminous and anthracite coal mines throughout the country declined 32% in the first six months of 1949 as compared with same period in 1948 and were 48% below the 1947 period, according to the records of the U. S. Bureau of Mines.

The tentative fatality rate for both industries for the first half of this year was 1.21 per million tons of coal

mined, compared with 1.55 in a similar period in 1948 and 1.84 in the first half of 1947. For the bituminous industry, the rate in the first six months of 1949 and 1948 was 1.12 and 1.46, respectively; and for the anthracite mining, 2.29 and 2.47, respectively.

According to the Bureau's records, 333 miners were killed in the first half of this year, 487 in 1948 and 634 in 1947. No major disaster occurred during the first half of 1949, it was pointed out, while in the same period in 1948 there were two, killing a total of 14 men. Falls of roof and face continued to be the largest single cause of fatalities in 1949, killing a total of 182 men in both industries compared to 286 men in 1948. Haulage was second, with a total of 74 deaths in 1949 and 81 in 1948. Other causes of fatalities and the resulting deaths in the first half of 1949 were: local explosions, 3; explosives, 13; electricity, 4; machinery, 7; shaft, 4; miscellaneous underground, 7; stripping or open-cut, 7; and surface, 32.

### Bureau of Mines in Regional Reorganization

Reorganization of the U. S. Bureau of Mines under a plan of regional administration designed to improve operating efficiency and service to the public was announced last month. Each of the nine regions is to be headed by a director who will be responsible for all activities of the Bureau in his area. The regions within the United States proper cover the Northwestern, Far Western, Rocky, Mountain, North Central, South Central, Southeastern and Northeastern areas. Alaska will constitute a region by itself and all foreign countries together the ninth region.

Under the plan, a new Minerals Division has been established, under the direction of J. H. Hedges, formerly chief of the Tucson division. The new division, which will be organized into various commodity groups, will absorb the functions of the present mining and metallurgical division and major parts of the economics and statistics division. The Fuels and Explosives Division is expected to remain essentially the same as at the present time but will take over petroleum and coal statistics, coordinating them with research and operations. Similarly, the Health and Safety Division will include the former accident-analysis branch.

The Administrative Division will be decentralized under the new set-up so that disbursements of funds, contracts and similar activities can be handled in the field by the regional directors. Consultants to the director of the Bureau added to the Washington staff include E. D. Gardner, chief mining engineer, Oliver C. Ralston, chief metallurgist, and a chief economist to be named.



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*The Thermoid Impregnation Process* insures a deeper penetration of rubber between the threads of the yarn, which encases each individual strand with protective rubber. The rubber acts as a sheath between the strands and prevents the destructive abrasive action as the product is flexed in use. To obtain the required rubber penetration, the twist of the yarn must be to exact specifications. With the yarn twisted too tightly, proper penetration of the rubber compound is impossible. This condition produces abrasion, causing premature failure. On the other hand, if the yarn is twisted too loosely, the product lacks tensile strength. Thermoid has discovered the optimum twist of the yarn which assures maximum rubber penetration and greatest strength. The development of Thermoid Impregnation Process is another step forward in Thermoid's planned program of product improvement, assuring maximum service and lower operating costs to industry through the use of Thermoid Industrial Rubber Products.

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## Success Marks First Test Of Stainless Steel Belt

The first tests in the United States of a stainless-steel conveyor belt in coal mines were made July 22 and were successful, according to an announcement by Gerald Von Stroh, director, Mining Development Committee, Bituminous Coal Research, Inc. The tests were made in the Crichton No. 4 mine, Johnstown Coal & Coke Co., Nicholas County, W. Va., over a period of several hours.

Mr. Von Stroh warned that initial success does not mean that stainless-steel belts have been developed to the point of commercial use. It means only that the use of such a belt has been found practicable. Further testing and development are expected to require at least six months longer.



**Harold Davis  
Joins Coal Age Staff**

HAROLD DAVIS, for two years assistant supervisor of Mining Extension for Pennsylvania State College, State College, Pa., joined the staff of COAL AGE Aug. 22 as assistant editor. Mr. Davis was born at Olyphant, Pa., May 19, 1918, and started his mining career as a laborer for The Hudson Coal Co. at the Grassy Island colliery in December, 1938. He entered Penn State in September, 1941, and received a degree of mining engineer in 1947, immediately joining the extension staff. During the war, Mr. Davis served from June, 1943, to June, 1946, with the Army Corps of Engineers, including a year in the Asiatic-Pacific Theater, rising from the rank of private to first lieutenant. Mr. Davis is a member of The Coal Mining Institute of America, The Mining Electro-Mechanical Maintenance Association and Sigma Gamma Epsilon, honorary mineral industries fraternity.

## Bureau of Mines Sets Up Roof-Control Unit

A new division to aid in the prevention of falls of roof and coal has been formed within the Health and Safety Division, U. S. Bureau of Mines, Director James Boyd announced Aug. 4. The new section, with main offices in College Park, Md., will be headed by Edward M. Thomas, who has been with the Bureau since 1936. Division stations also will be set up at Jellico, Tenn.; Norton, Va.; Mt. Hope and Fairmont, W. Va.; Vincennes, Ind.; Denver, Colo.; and Pittsburgh, Johnstown and Wilkes-Barre, Pa.

## Welfare-Fund Operations Revealed in Hearing

The UMWA Welfare & Retirement Fund for bituminous miners paid out \$104,880,785 in benefits in the 12 months ended June 30, 1949, and in the same period of time brought reserves in the fund down from \$42,959,638 to \$29,424,750. These data were revealed in testimony Aug. 1 by Josephine Roche, director of the fund, before a subcommittee of the Senate Banking and Currency Committee in Washington, which is holding hearings on the monopoly powers of unions. Miss Roche also disclosed that Ezra Van Horn, the operators' representative on the fund's three-man board of trustees, and Sen. Styles Bridges, neutral trustee, were being paid salaries of \$35,000 a year for their services, but that Mr. Lewis, although entitled to that salary, did not take it.

Following reports of Miss Roche's disclosures, Sen. Bridges asserted that he spent a substantial portion of the salary for legal advice in connection with the fund's administration. Min-

utes of the trustees' meetings later reported showed that he received an additional \$12,000 for private actuarial advice. Sen. Bridges Aug. 16 announced that he planned to resign his post as trustee in September, after completion of the fund's first yearly report. Mr. Van Horn, who also is executive vice president of the Ohio Coal Association, resigned Aug. 11 as chairman of the joint wage negotiating conference.

Income from the 20¢-per-ton levy on bituminous production amounted to \$90,891,905 in the 12-month period, Miss Roche said. The fund has aided 397,097 men, women and children in 26 states, she reported. She offered a breakdown of disbursements as follows:

Death benefits, \$5,546,853.  
Disability grants and widows, assistance, \$64,206,596.  
Pensions, \$30,366,264.  
Medical, health and hospital service, \$4,761,071.

Administrative costs, \$1,535,933, about 1.4% of payments.

Miss Roche told the committee she was not disturbed by the excess of expenditures over income because much of the money was used to take care of long-standing disability and distress cases that would not be recurring. She revealed also that delinquencies for the year in operators' payments into the fund amounted to only 0.6% of collections.

## Railroads Authorized Additional Freight Rise

The Interstate Commerce Commission Aug. 11 authorized the nation's railroads to increase freight rates by an average of 4% in addition to the temporary boost averaging 5.2% put in effect last January. For anthracite and bituminous coal and coke, the new rate, which was expected to take effect Sept. 1, is 10% above the rates of last fall, with a maximum of 35¢ per net ton and 39¢ per gross ton. Last January's temporary increase on coal was 6%. In their actions begun last fall, the railroads asked for a general increase of 13% and 40¢ a net ton on coal.

## 140-Mile Tunnel Studied For Anthracite Drainage

A proposal to construct a 140-mile water-drainage tunnel in the lower anthracite region, which was dropped in 1941, is again under consideration. It was reported early last month, Richard Maize, Pennsylvania Secretary of Mines, said that engineers of the U. S. Bureau of Mines had been working on the plan for some time and that the state mines and health departments had been asked to join in research on the effects of acid mine waters on such a tunnel. It would be a long time before construction could be undertaken, he pointed out, since it must be first determined whether "yellow boy," a sediment produced by the iron oxides in the water, would clog the tunnel or pumps.

## Mine Inspection Bills Still Before Congress

The Senate bill, S. 1031, granting federal inspectors power to close coal mines considered unsafe was on the Senate calendar awaiting action of the entire body last month, following its recommendation by the Committee on Labor and Public Welfare July 18. In the House, an Education and Labor subcommittee voted July 22 to report a similar bill, H.R. 3023, to the full committee.

*New*

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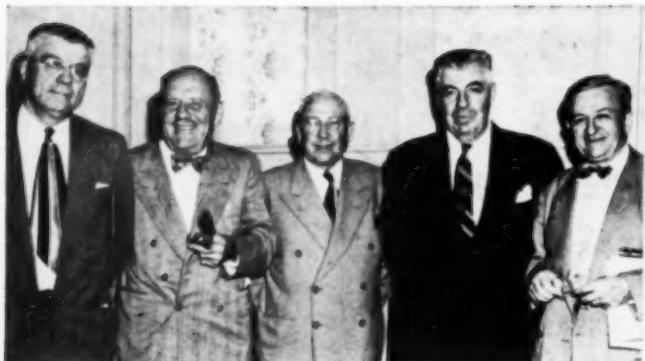
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**OFFICERS AND SPEAKERS** at the NCA Denver regional meeting Aug. 3 included: Paul L. Shields (left), president, Spring Canyon Coal Co.; Charles A. Owen, NCA president; A. B. Foulger, vice president, Lion Coal Co.; W. C. Shank, president, Crowe Coal Co.; John D. Battle, NCA executive vice president; and George H. Rupp, manager, mining department, Colorado Fuel & Iron Corp.



**OTHER PARTICIPANTS** in the day-long review of NCA activities and coal-industry prospects were: K. A. Spencer (left), president, Pittsburg & Midway Coal Mining Co.; Ambrose J. Seitz, executive vice president, Union Pacific R.R. Co.; and D. H. Pape, retired president, Sheridan-Wyoming Coal Co., Inc.

## NCA Denver Meet Well Attended

MORE THAN 100 southwestern and western operators heard officials and staff members of the National Coal Association outline the work of the organization and the future prospects of the coal industry in the West and throughout the nation at another in a series of NCA regional meetings held in Denver, Colo., Aug. 3.

George H. Rupp, manager, mining department, Colorado Fuel & Iron Corp., who presided at the morning session emphasized the vital importance of coal in the United States economy and pointed up the value of NCA activities to western and other operators. While the Far West represents only about 6½% of the national production, its reserves are estimated at 73 to 80% and in the long-term future the Far West will be the basis of the country's industrial power, he said.

Discussing "Cooperative Effort at the National Level," Charles A. Owen, NCA president, pointed out that Far Western members were drawn from 10 states and that they were "firm in their support of the association." Following his review of the various NCA departments and affiliates, he outlined the purpose of the new natural resources committee recently formed to study and analyze competitive fuel markets. Stating that the monopolistic labor situation has "reached a point where it would have to change," Mr. Owen said NCA needed the complete support of the industry in its efforts to remove labor from anti-trust exemption.

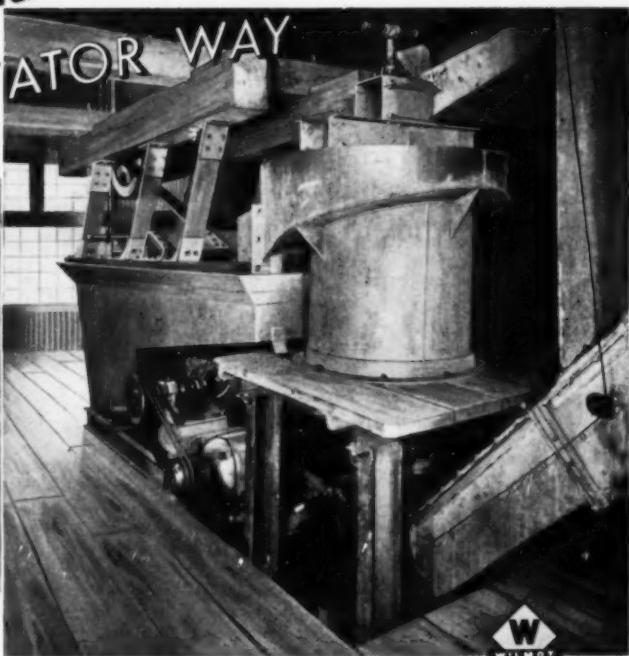
Other talks in the morning program included a "Review of Activities and Discussion of the Future Program of the Association," by John D. Battle, executive vice president, and a prog-

ress report, "Your Retail Market," by J. Nelson Stuart, manager, Coal Heating Service Division. In outlining the advertising and promotion work of the division, Mr. Stuart said that CHS groups were operating in 67 cities, of which 30 were west of the Mississippi and 13 in the Far West, and that NCA contributed a total of \$95,000 to the West.

Also speaking in the forenoon were A. B. Foulger, vice president, Lion Coal Corp., and W. C. Shank, president, Crowe Coal Co.

K. A. Spencer, president, Pittsburg & Midway Coal Mining Co., presided at the luncheon and introduced the guest speaker, Ambrose J. Seitz, executive vice president, Union Pacific R.R., who told of the tremendous interest in the gas-turbine railroad locomotive and said that he could envision its use in the not-too-distant

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Whether the feed capacity of your plant is 10,000 tons or 300, you can now adopt the well-known economies of the Hydrotator method in preparing all anthracite sizes from Egg down to No. 5. Each of the new Hydrotators and Hydrotator-Classifiers, added to complete the Wilmot line, was especially designed for its particular operation. For instance, the new Hydrotators for Egg, Stove and Nut were in every way built to take the heavier loads. Likewise, the new small Hydrotators and Hydrotator-Classifiers for low-tonnage plants are notable for their small

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future with oil-treated fine coal. The experimental General Electric turbine having the power of three ordinary diesel locomotives was under successful test by the Union Pacific, he reported, and it was his feeling that this type of turbine would be adapted for coal use.

With Paul A. Shields, president, Spring Canyon Coal Co., presiding during the afternoon, James A. Haley, NCA secretary and general counsel, discussed "Federal Tax Problems and Prospects." While Mr. Haley foresaw no substantial reduction in taxes in the immediate future, he said that the Revenue Code would be overhauled next year and that NCA would advocate changes in the depletion rates, a new basis for depreciation and a change in the transportation tax.

Speaking on "The Work of the Bituminous Coal Institute," Ralph C. Mulligan, BCI director, outlined its many activities and said that its task was to develop a friendly public attitude toward the coal industry, instill respect instead of criticism and contempt, replace prejudice with facts, show that the industry is well managed and progressive and, in a word, demonstrate that the public is being well served by those who manage the mines. In his talk, "Safety Is Everybody's Business," Earl R. Maize, NCA director of safety, stressed that his division acted as a clearing house for all operators on safety information and that any company, whether a member of NCA or not, could call on the Safety Division and be assured of cooperation.

In the evening, Mr. Rupp was host at a dinner at the Denver Club for NCA executives present and other coal operators.

## AIME Meeting Offers Broad Technical Program

An extensive technical program covering various phases of the coal industry has been announced for the mid-year meeting of the AIME to be held in Columbus, Ohio, Sept. 25-Oct. 1.

The Coal Division will open its sessions with a student forum, Sept. 26, with C. E. Lawall, Chesapeake & Ohio Ry., acting as moderator. Others expected to participate include: A. R. Anderson, manager of sales, Mining Division, Jeffrey Mfg. Co.; C. E. Bales, vice president, Ironton Firebrick Co.; M. D. Cooper, manager, vocational training, NCA; Gerald G. Gambs, manager, service department, Pittsburgh Consolidation Coal Co.; James Hyslop, executive vice president, Hanna Coal Co.; L. F. Reinartz, vice president, Armcoc Steel Corp.; D. T. Ring, vice president, Preston Oil Co.; and Clyde E. Williams, director, Battelle Memorial Institute.

Papers to be presented at the Tuesday session, and their authors, will



## Give-Away Package Helps Sell Stoker Coal

CORRUGATED FIBER BOXES containing 50 lb of stoker coal are being used by salesmen of the Grasso Bros. Coal Co., St. Louis, Mo., to provide home-heating prospects with coal samples for trial. Manufactured by the Gaylord Container Corp., St. Louis, the specially designed boxes are printed in black and silver and have self-sealing top and bottom covers that prevent spillage when taken to the prospect's living room. Instructions printed on the top cover explain how the boxes can be used as basement trash receptacles after the coal has been removed. Grasso Bros. reportedly is planning to extend use of the sampling box to all types and grades of coal handled.

include: "Coal Reserves of Perry County," Norman K. Flint, Ohio Geological Survey; "Research in Coal Geology," Gilbert H. Cady, Illinois State Geological Survey; "Preparation of Coals for Synthetic Liquid Fuels," William J. Crentz and J. D. Doherty, U. S. Bureau of Mines; "The Analysis for a Continuous-Mining Machine," Gerald von Stroh, BCR Mining Development Committee; "The Colmol, a Continuous-Mining Machine," Clifford H. Snyder, Sunnyhill Coal Co.; "The Continuous Miner," W. B. Jamison, Jamison Coal & Coke Co.; and a discussion of synthetic-liquid-fuels studies in Ohio, by W. H. Smith, Geological Survey of Ohio, and C. A. Bowen, Ohio State University.

On Wednesday the following will be presented: "Promises for AC Power Economics With New Mining Methods," J. R. Guard, Rochester & Pittsburgh Coal Co.; "Latest Developments in Roof Bolting," Edward Thomas, U. S. Bureau of Mines; "Mine-Roo Pinning," Lee Sinif, Consolidation Coal Co. (Ky.); "Some of the Unknown Air-Polluting Solids of Allegheny County," T. C. Wurts, County

of Allegheny; and "Air Pollution by Industrial Gases and Liquids," L. C. McCabe, U. S. Bureau of Mines. Discussions will be led by W. C. L. Hemeon, Industrial Hygiene Foundation, and Henry F. Hebley, Pittsburgh Consolidation Coal Co.

An inspection trip to the Georgetown strip and an underground operation of The Hanna Coal Co. at St. Clairsville and Cadiz will be a feature of the program for Thursday. Visitors will have an opportunity to view the new 49-yr shovel—the world's largest—in operation, as well as tour a cleaning and drying plant that dries coal to within 2% of surface moisture and one of Hanna's modern underground mines. Another inspection trip will cover the Columbus plant and research laboratory of the Jeffrey Mfg. Co., where the manufacture of various mining machinery and equipment can be studied first hand from raw material to the finished part.

## Joint Meeting Set for W. Va., AIME Groups

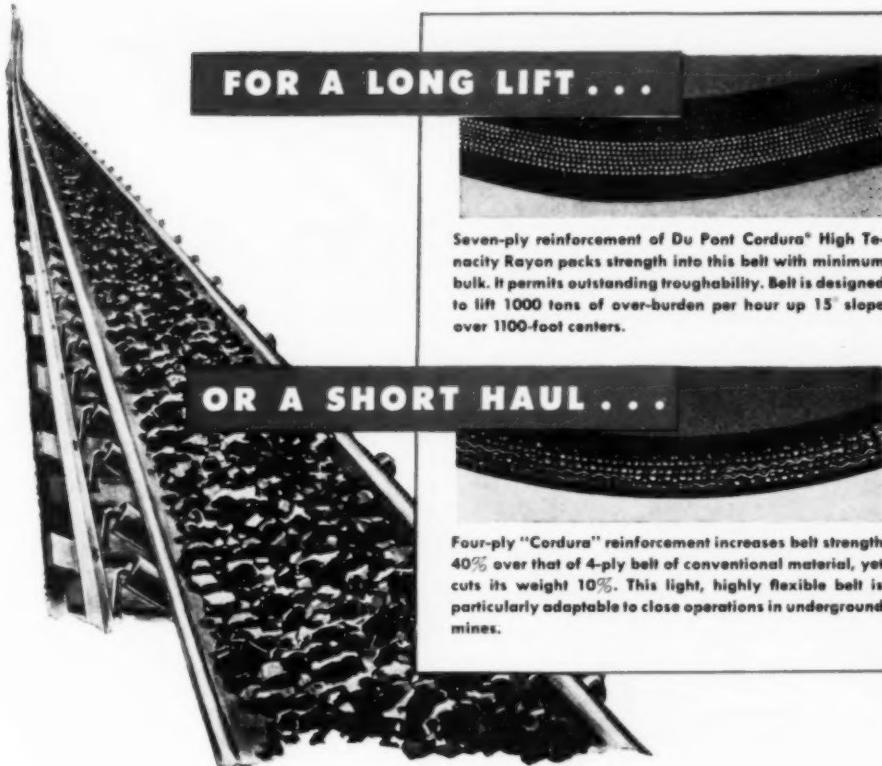
A joint meeting of the West Virginia Coal Mining Institute and the Central Appalachian Section, AIME, has been announced for Nov. 11-12 at the Summit Hotel, near Uniontown, Pa. Technical sessions beginning on Friday will be adjourned Saturday in time for those attending to take in the West Virginia-Texas Mines football game in Morgantown that afternoon.

George Higinbotham and Lee M. Morris have been named co-chairmen of the program committee and details of the comprehensive program being planned are to be released at a later date. As the complete facilities of the hotel are being reserved for the meeting, according to the announcement by G. R. Spindler, secretary-treasurer of the West Virginia Institute, members and others expecting to attend are urged to make reservations as early as possible, addressing: Sam Stewart, manager, Summit Hotel, P.O. Box 151, Uniontown, Pa.

## Two-Day Program for Joint AIME-ASME Meet

The 12th joint meeting of the Coal Division, AIME, and Fuels Division, ASME, to be held at the French Lick Springs Hotel, French Lick, Ind., Oct. 26-27, will include 1½ days of technical sessions on coal preparation and utilization, followed by a visit to the Maid Marian strip mine of the Central Indiana Coal Co., according to the tentative program recently announced.

The opening session, Wednesday



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- ★ Reduced operating power expense

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**THE GRINNELL-SAUNDERS DIAPHRAGM VALVE** has only one part that normally wears and needs replacement . . . the diaphragm. Depending on the type of service, it may last for years or only months. It can be replaced in just a few minutes. The valve body doesn't have to be removed from the pipe line . . . only the bonnet. The new diaphragm is attached to the bonnet which is then bolted back onto the valve body . . . and the valve is restored to service. That's all the maintenance a Grinnell-Saunders Diaphragm Valve normally needs. No packing glands to demand frequent attention. No refacing or reseating required, because there are no metal-to-metal seats to become damaged or wire drawn.

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morning, will be devoted to a symposium on the dewatering and drying of coal. Papers to be presented include: a report on experience in drying fine coal at the Bureau of Mines Experiment Station, Golden, Colo., by V. F. Parry and E. O. Wagner; separate discussions on flash drying by F. P. Calhoun, Rochester & Pittsburgh Coal Co., and E. C. Carris, Roberts & Schaefer Co.; and "Coal Drying in the Multi-Louvre Dryer," by John L. Erisman, Link-Belt Co.

While the final program had not been released for the afternoon session, at which members of the ASME Fuels Division will present papers, it was expected that the session would emphasize certain important problems in coal combustion.

The morning session on Thursday will include a discussion of froth flotation of coarse-coal particles, by R. E. Zimmerman and S. C. Sun, Pennsylvania State College; a description of the laboratory control practiced at the mines of the Ayrshire Collieries Corp., by James J. Merle and Richard A. Mullins; and a paper on the use of ignition baffles with single-retort stokers by T. C. Spicer, Pennsylvania State College.

The trip to the Maid Marian mine, Thursday afternoon, will be conducted by R. G. Baughman, general superintendent, preparation and construction, Central Indiana Coal Co. In addition to viewing some of the latest earthmoving machinery in action, visitors will have an opportunity of seeing a coal dryer of Mr. Baughman's design in operation (*Coal Age*, p. 96, April, 1949).

Registration blanks and further details are to be sent to members of the two divisions about six weeks prior to the meeting. Invitations to attend also are being extended to members of the Central Indiana Section, ASME, and the Indiana Coal Preparation and Utilization Society.

## Large Anthracite Market Seen in Tobacco Curing

Continued successful results in curing tobacco with buckwheat-size anthracite indicates that a new market with a potential of well over a million tons a year is an encouraging possibility, the Anthracite Institute reported last month. Interest in the use of anthracite is increasing at a rapid rate, not only in the bright-leaf district centering around North Carolina but also in the Canadian flue-curing tobacco-raising areas, it said. Since anthracite's combustion products can be discharged directly into a tobacco barn without requiring expensive piping and ductwork, anthracite has a great advantage over competitive fuels, the Institute explained.

Studies during the 1947 and 1948 season by engineers of anthracite-producing companies, stoker manufac-

turers and the Anthracite Institute, in cooperation with experts of the United States and North Carolina Departments of Agriculture, indicated that the advantages of anthracite could best be gained through the development of a new type of stoker. Four models of a furnace-burner unit designed by Institute engineers for low-cost, efficient and safe operation and simple installation are currently being tested under actual operation in North Carolina.

While the ability of anthracite to produce uniformly high-quality bright-leaf tobacco has been amply demonstrated, the Institute reports, other tests are being carried on this year to determine the quality and aging properties of anthracite-cured tobacco. Tobacco authorities, including federal, state and county officials, are said to report a growing interest in anthracite on the part of farmers. "It can now be predicted that in 1950 an anthracite tobacco-curing unit will be commercially available and with its availability the tobacco-curing market for anthracite should increase with great rapidity," the Institute said.

## 4,900 Miles of Pipelines Approved in Part of 1949

Construction of some 4,900 miles of natural-gas pipeline was authorized by the Federal Power Commission during the first six months of 1949, it was announced last month. According to the commission, the facilities will cost an estimated \$374,820,900 and will have a total daily capacity of 2 billion cubic feet. The amount actually delivered to market will be somewhat smaller, it was pointed out, since in several instances the same gas will be carried through new facilities of two different companies.

About 4,641 miles of the new lines are involved in major projects estimated to cost \$700,000 or more, for a total cost of \$351,723,600 and a total daily capacity of 1,907,100,000 cu ft. These major projects are expected to serve 72 cities of over 50,000 population, as well as smaller communities, the commission reported.

In a series of moves before the Federal Power Commission, natural-gas companies in July asked for permission to extend their pipeline mileage and sell more gas in coal's market areas. Meanwhile, debate continued over recent government action which will permit the Atomic Energy Commission's plants at Oak Ridge, Tenn., to use natural gas to supplement coal.

In Virginia, Commonwealth Natural Gas Corp. asked the FPC for authority to build a 200-mile line to carry natural gas to industrial and utility customers and municipalities. Sales would be close to 15,000,000,000 cu ft per year. Also in Virginia, Virginia Natural Gas Co. is seeking permission to build a 153-mile pipeline

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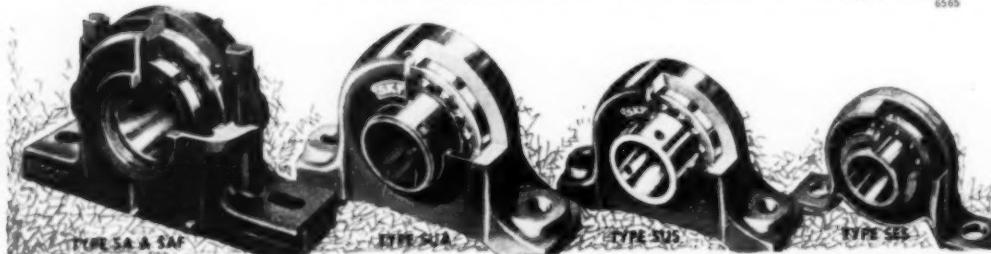
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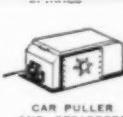
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ENGINEERS, MINE FOREMEN AND OTHERS WHO are daily engaged in the care, maintenance and operation of storage batteries and battery-operated equipment to a five-day training school to be held Nov. 14-18 at Gould's Trenton plant.

The course, which is the second in the company's current series, is designed to help industry get the maximum efficiency and life from its storage batteries. Improper maintenance and charging are currently robbing industry of from 30 to 50% of its battery capacity, according to the company.

Expenses for the trip, which are paid by companies sending their employees, include transportation, hotel accommodations and meals, except for lunches which are supplied by Gould. The school is conducted on a regular academic system, with periodic tests and award of diplomas on completion. Some 10 representatives of five coal mining companies attended the first course given last fall (*Coal Age*, December, 1948, p 150).

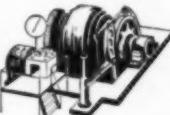
The course is being planned to cover storage-battery theory and design, electrical theory, battery layout, charging methods and maintenance procedures, with 17 different lectures by field engineers and outside consultants, plus laboratory projects and



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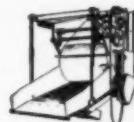


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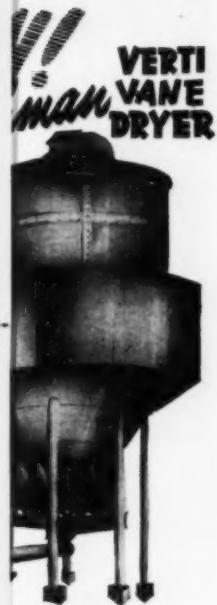


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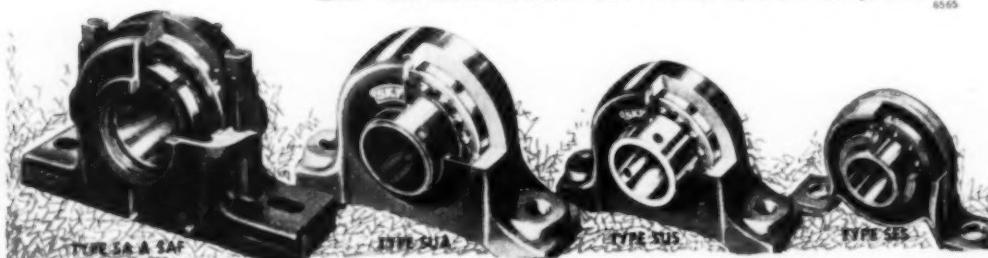
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to serve the same customers that Commonwealth Natural Gas Corp. would serve.

Texas Eastern Transmission Co. meanwhile has been authorized to deliver and sell surplus gas available in its system to gas utilities on an interruptible basis. The surplus is estimated to range from 60,290,000 cu ft daily in July to 24,250,000 cu ft in October.

Eastern Natural Gas Corp., a newly organized company, has asked permission to build a 292-mile 24-in line from Phoenixville, Pa., to Boston, Mass., along with some 200 miles of lateral lines to serve cities along the route. Initial capacity would be 200,000,000 cu ft daily with increases in prospect up to 275,000,000 cu ft.

Texas Illinois Natural Gas Pipeline Co., a new organization set up by Peoples Gas Light & Coke Co., Chicago, soon is expected to take over construction and operation of a 1,000-mi or longer 30-in line between Houston, Tex., and connections at Joliet, Ill. Petitions for FPC permission to proceed are expected to be filed shortly in Washington. Peoples Gas Light & Coke Co., under FPC authorization, recently acquired control of Natural Gas Pipeline Co. of America and Texoma Natural Gas Co.

## Battery Maintenance Men Invited to Training School

The Gould Storage Battery Corp., Trenton, N. J., is inviting companies utilizing motive-power storage batteries to send battery-maintenance supervisors, material-handling engineers, mine foremen and others who are daily engaged in the care, maintenance and operation of storage batteries and battery-operated equipment to a five-day training school to be held Nov. 14-18 at Gould's Trenton plant.

The course, which is the second in the company's current series, is designed to help industry get the maximum efficiency and life from its storage batteries. Improper maintenance and charging are currently robbing industry of from 30 to 50% of its battery capacity, according to the company.

Expenses for the trip, which are paid by companies sending their employees, include transportation, hotel accommodations and meals, except for lunches which are supplied by Gould. The school is conducted on a regular academic system, with periodic tests and award of diplomas on completion. Some 10 representatives of five coal mining companies attended the first course given last fall (*Coal Age*, December, 1948, p 150).

The course is being planned to cover storage-battery theory and design, electrical theory, battery layout, charging methods and maintenance procedures, with 17 different lectures by field engineers and outside consultants, plus laboratory projects and



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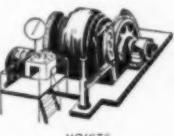
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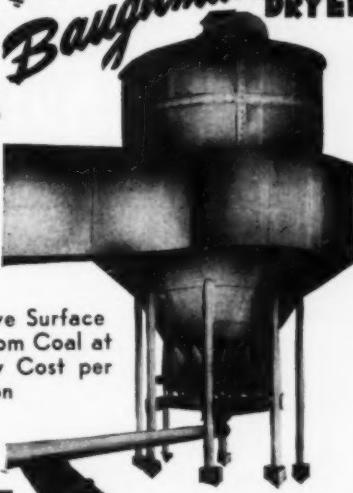


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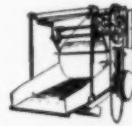
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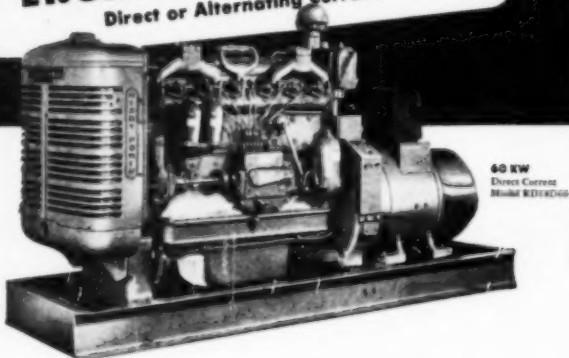
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### Coal Co. Railroad Acquires Two Diesels

KARL M. MARQUIS, chairman of the board, Warner Collieries Co., Cleveland, is shown in the cab of one of two new 600-hp diesel locomotives immediately after they were delivered to the Kelly's Creek R.R., a Warner subsidiary that hauls coal from Warner mines at Mammoth, W. Va., to its docks at Cedar Grove, W. Va., a distance of 6.5 mi. "While we are in the coal business, with operations in both Ohio and West Virginia, we are in business to make money. Since it is more economical for our company to use diesel power than steam, we switched to diesels," Mr. Marquis said. The second unit was named for W. F. Wolfe, vice president of the company. Other coal operators in the same area are understood to be planning diesel operation, with an order for one diesel reportedly already placed by the Kelly's Creek & Northwestern Ry., a 6.7 mi subsidiary line of the Valley Camp Coal Co.

demonstrations. Much of the material presented will be mimeographed and given to students for future reference on the job.

A 13-page bulletin on the course may be obtained by writing J. A. Gilruth, School Director, Gould Storage Battery Corp.

### Repllier Coal Team Wins Anthracite Safety Meet

For the second consecutive year, top honors in the Annual Safety Day and First Aid Meet, held Aug. 6 at Lakewood Park, near Mahanoy City, Pa., were captured by the team from the Repllier Coal Co., Buck Run, Pa., which, with a score of 99.58, took first prize money of \$150 in a field of 11 teams.

Sponsored by the 38 anthracite companies of the Middle and Southern Individual Anthracite Operators' First-Aid-Meet Association, the fifth annual event attracted several hundred spectators to witness demonstrations of

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**EQUIPMENT APPROVALS**

Three approvals of permissible equipment were issued by the U. S. Bureau of Mines in July, as follows:

Joy Mfg. Co.—JCM-IE/F continuous miner; seven motors; two 65 hp, three 7½ hp and two 5 hp, 250 and 500 v, dc; Approvals Nos. 2-675 and 2-675A; July 1.

Ensign Electric & Mfg. Co.—Distribution box; three or four circuits, 250 v, dc; Approval No. 2-676; July 12.

Joy Mfg. Co.—U-179-51N conveyor; one motor, 20 hp, 500 v, ac; Approval No. 2-677A; July 14.

mine safety work. Cash prizes of \$525 were given to the five winning teams, with second to fifth awards going to St. Clair Coal Co., Phoenix Coal Co., Locust Coal Co., and Buck Run Coal Co.

In a special event, three Boy Scout teams from the Appalachian Trail Council, BSA, competed for \$100 in awards.

Richard Maize, Secretary, Pennsylvania Department of Mines, addressed the teams and spectators briefly. The program, directed by State Mine Inspector Timothy A. Ryan, was presented in cooperation with the UMWA, the Pennsylvania Department of Mines and the U. S. Bureau of Mines. Joseph Ruane was chief judge of all events.

A letter of greeting was read for Thomas Kennedy, UMWA vice president, who was unable to be present. Joseph Kershetsky, president, UMWA District 9, addressed the gathering.

**Company Must Match  
RFC Loan for Pumps**

The Reconstruction Finance Corp. will lend \$200,000 to the M. & S. Coal Co., Minersville, Pa., only if the sum can be matched by funds from private sources, it was learned Aug. 4. The company, with the help of Theodore Roosevelt III, Pennsylvania Secretary of Commerce, and Congressman Ivor Fenton, sought the RFC loan to buy pumps to prevent flooding the mine. Without the needed pumps, it is said, water threatens to put the company out of business and seriously affect the town of Minersville. About 300 men are employed at the mine. The RFC also has asked for a complete audit of the M. & S. Coal Co. and the Schrader Coal Co., which operates a breaker at the mine.

Meanwhile, Sen. F. J. Myers, of Pennsylvania, announced that he has arranged a hearing by a special subcommittee of the Senate Banking & Currency Committee to explore the possibility of rewriting RFC laws to make the loan possible. Earlier, on June 30, the RFC had turned down the company's request for a loan be-



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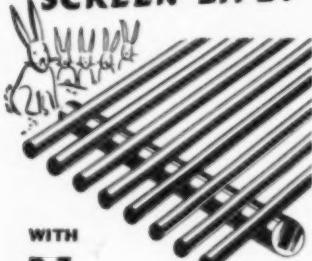
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Probably those underground mine timbers are free from decay . . . probably the mine's ventilating system is in good working order . . . probably the elevator shaft cables are safe . . . but you can never be sure of complete mine safety with "probabilities."

Bituminous Casualty Corporation removes all doubt concerning mine safety with its extensive Safety Engineering Program. Available to Bituminous Workmen's Compensation policyholders, this program helps save lives and reduce the frequency and severity of accidents. It includes regular mine inspections . . . analysis of mine hazards . . . survey recommendations . . . acci-

dent prevention activities . . . reduction of operating expenses resulting from accidents . . . and establishment of production efficiency.

Mine owners, operators and workers alike are served by Bituminous Casualty Corporation and its Safety Engineering Program.

**BITUMINOUS CASUALTY CORPORATION**  
ROCK ISLAND, ILLINOIS

**SECURITY WITH SERVICE**

## Cool and Business Activity

	Net Tons	1949 to This Date	1949 Over 1948, to Date
Est. anthracite prod., week ending Aug. 13 . . .	695,000	28,856,000	+26.5%
Est. bituminous prod., week ending Aug. 13 . . .	8,000,000	297,648,000	+17.2%

Source: U. S. Bureau of Mines.

July 1, 1949	Days' Supply	Bituminous Coal Stocks		Consumption		
		(Thousands, net tons)	June 1, 1949	July 1, 1949	June, 1949	May, 1949
Electric power utilities . . .	23,607	121	25,444	17,041	6,338	6,142
By-product coke ovens . . .	13,747	63	15,870	10,474	7,523	8,305
Beehive coke ovens . . .	9	9	9	9	415	825
Steel and rolling mills . . .	1,376	74	1,360	1,269	559	621
Cement mills . . .	1,605	78	1,433	1,381	633	670
Other industries . . .	17,189	72	16,465	17,234	7,147	7,283
Railroads (Class I) . . .	9,818	36	9,701	8,787	5,274	5,892
Retail dealers . . .	2,810	13	2,482	1,844	3,717 <sup>a</sup>	3,046 <sup>a</sup>
Total . . .	74,152	66	72,755	58,010	33,606	34,764

Source: U. S. Bureau of Mines. <sup>a</sup>Not available. <sup>b</sup>Retail dealer deliveries.

Latest Week <sup>c</sup>	Month Ago	Year Ago
Business Week Index of Business Activity, week ending Aug. 13 . . .	181.2	178.0
Steel ingot operations (% of capacity) . . .	83.5	78.3
Electric power output (million kw-hr) . . .	5,530	5,342
Crude oil production (daily avg., 1,000 bbl) . . .	4,723	4,671
Misc. & L.C.L. carloadings (daily avg., 1,000 cars) . . .	70	69
All other carloadings (daily avg., 1,000 cars) . . .	30	35
Prices, spot commodity index (Moody's, Dec. 31, 1938 = 100) . . .	339.8	341.7
Prices, industrial raw materials (BLS, Aug. 1938 = 100) . . .	217.5	212.2
Prices, domestic farm products (BLS, Aug. 1938 = 100) . . .	291.9	299.0
Prices, finished steel composite (Iron Age, lb) . . .	3.705c	3.705c
Stocks, price index (Standard & Poor's Corp.) . . .	121.8	117.9

<sup>c</sup>Date of latest week for each series on request.

cause, the agency said, guarantees of repayment were inadequate. No date has yet been set for the hearing.

## Ohio Governor Names Strip-Mining Board

Zoyd M. Flaler, service director and city engineer, Coldwater, Ohio, has been named chief of the Division of Reclamation, Ohio Agriculture Department. The new division head will be responsible for administering Ohio's new law governing striping operations. The law requires strip operators to obtain licenses and to post bonds guaranteeing restoration of mined-out lands. (*Coal Age*, August, 1949, p 122). It also sets up a five-member board of review to hear and rule on appeals from decisions of the division chief. At the end of July, Governor Lausche still was engaged in controversy with the Senate over two appointees to the board of review whom the Senate has refused to confirm. The governor charged that strip-mine operators were responsible for the rejections.

## Preparation Facilities

New River & Pocahontas Consolidated Coal Co., Layland mine, Layland, W. Va.—Contract closed with Fairmont Machinery Co. for addition to present facilities, with 6x4-in washed by the Chance process; capacity, 350-tph, run-of-mine.

The Hanna Coal Co., Georgetown

*IF your goal is...*

*You need...*

**GREATER OUTPUT AT LOWER COST**

**LIMA type 1201**

3 or 3½ yd. capacity



*TAKE A LOOK AT THESE  
Features*

- Precision Air-Control of all major operations.
- Big, wide drums.
- One-piece cast, annealed steel machine base.
- Crawlers are extra long and wide, for greatest ground bearing area.
- Splined shafts for permanent alignment.
- Control permits hoist, swing, propel and boom up or down at the same time.
- Rugged Diesel or electric power for big output in hard digging.
- Big, roomy all-steel cab.
- Independent chain crowd on shovel.
- Anti-friction bearings throughout, including the drums.
- Large, deep-throated point sheaves on crane or dragline boom.
- and many others.

● Mine operators faced with the problem of maintaining profits despite continually rising labor and other costs, will find a solution in the LIMA Type 1201 shovel, crane and dragline. Here is a machine capable of *peak production* day after day with greater efficiency, fewer delays and less operator fatigue. The shovel and dragline are especially designed and built for hard usage in open-pit and strip mines.

*A LIMA representative will gladly show you how a LIMA Type 1201 can cut costs on your mining operations. The LIMA line includes shovels ¼ to 6 yards, cranes 13 to 110 tons, and draglines variable.*

**Lima Shovel and Crane Division**

LIMA, OHIO

OTHER DIVISIONS: Lima Locomotive Works Division; Niles Tool Works Co.; Hoover, Owens, Rentschler Co.



We were lifting  
a \$50,000  
generator

and I could  
have saved  
\$7.63 on clips

but I'd rather be  
safe than sorry!...



That's why  
industry uses more

## CROSBY CLIPS

than all other  
drop-forged fasteners  
combined.

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Who'd want to save \$7.63 on wire rope fasteners on a \$50,000 piece of equipment, when absolute safety costs so little more? Genuine CROSBY CLIPS—drop-forged (not cast!) of tough, resilient steel, have tremendous extra strength to withstand "X-shock"—that unforeseen blow that engineering can't anticipate. Specify genuine CROSBY CLIPS . . . and enjoy real peace of mind! Sizes for  $\frac{1}{8}$ " to 3" wire rope. Distributors everywhere. Made only by AMERICAN HOIST AND DERRICK COMPANY, St. Paul 1, Minnesota.

No. 12 mine, Georgetown, Ohio—Contract closed with Fairmont Machinery Co. by the Allen & Garcia Co. for one 16-ft 6-in diameter Chance cone with middlings spout and auxiliary equipment to wash  $1\frac{1}{4} \times \frac{1}{4}$ -in coal; capacity, 575 tph.

Pine Creek Coal Co., Spring Glen, Pa.—Contract closed with Wilmot Engineering Co. for two Type A jigs to prepare stove and nut coal; feed capacity, 30 tph.

Alabama Fuel & Iron Co., Margaret mine, Colgate, Ala.—Contract closed with Deister Machine Co. for eight Deister No. 16 PLAT-O coal-washing tables to handle  $1\frac{1}{4} \times 0$ -in coal; capacity, 65 to 75 tph.

Bethlehem Collieries Corp., Mine No. 51, Ellsworth, Pa.—Contract closed with Deister Concentrator Co. for four SuperDuty Diagonal-Deck No. 7 coal-washing tables to clean  $\frac{3}{4} \times 0$ -in coal.

Evans Coal Co., Bokoshe, Okla.—Contract closed with Deister Concentrator Co. for one Concenco revolving feed distributor.

Beaver Coal & Mining Co., Ligon, Ky.—Contract closed with McNally-Pittsburg Mfg. Corp. for washery addition to present plant consisting of one McNally-Norton automatic unit washer to process  $1 \times \frac{1}{4}$ -in coal, complete with 6x16-ft Allis-Chalmers double-deck dewatering screen; capacity, 100 tph.

Winco Block Coal Co., Naugatuck, W. Va.—Contract closed with McNally-Pittsburg Mfg. Corp. for washery addition to present preparation facilities consisting of one McNally-Norton automatic unit washer to process  $4 \frac{1}{2} \times 0$ -in coal, with classification of washed coals by purchaser; capacity, 80 tph.

Jewell Ridge Coal Corp., Blair Fork mine, Delphia, Ky.—Contract closed with McNally-Pittsburg Mfg. Corp. for washery addition to present facilities, incorporating one McNally-Norton unit washer, two Allis-Chalmers vibrating dewatering-classifying screens, additional loading booms and attendant conveyors.

Red Jacket Coal Corp., Junior mine, Red Jacket, W. Va.—Contract closed with McNally-Pittsburg Mfg. Corp. for washery addition to present tipple; 350 tph of run-of-mine feed to be prescreened on existing shaking screens, with resultant  $5 \times 0$ -in raw coal delivered to three Allis-Chalmers Ripple-Flo screens for removal of  $1 \frac{1}{4} \times 0$ ;  $5 \times \frac{1}{4}$  to be processed at 240 tph through one five-cell McNally-Norton automatic washer, with washed coal sized and dewatered over vibrating screens; all minus- $\frac{1}{4}$  degradation to be recovered via the new water-clarification system and dewatered and mixed back with  $1 \frac{1}{4} \times 0$  raw coal and  $2 \times \frac{1}{4}$  washed coal to make a 2x0 product; classification of washed coals to be at  $5 \times 3$ ,  $3 \times 2$  and  $2 \times 0$ , with complete mixing and loading facilities.

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CORE DRILLING  
DEMANDS  
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Are also manufactured by Sprague & Henwood, Inc. . . . full details sent on request.

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# outstanding improvement in DIAPHRAGM VALVES

## by CRANE

**NEW SEATING ARRANGEMENT  
MORE DURABLE...  
SAFER... MORE EFFICIENT**

Now, after completing exhaustive tests, Crane presents this better diaphragm valve—better suited for more services under today's working conditions. Stemming from basic improvements, such as the radically new bonnet-sealing and valve-seating arrangement, this original Crane design introduces many outstanding service features like those shown here.

- 1. LONGER DIAPHRAGM LIFE**, because diaphragm is used *only* to seal the bonnet—not for seating.
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- 3. ACCURATE SEATING**—new flat face disc with durable, resilient seating surface assures tight closure on all fluids.
- 4. GREATER FLOW CAPACITY** with reduced resistance and pressure drop, assured by Crane Y-pattern body design.
- 5. EASIER OPERATION**—Crane separate disc and diaphragm construction takes less torque—fewer turns—to operate.

### IDEAL FOR MINING SERVICES



Stem cap for valves 2-in. and smaller.

Rugged and durable, these valves meet the need of mining operations, at the same time allowing maximum standardization and simplified maintenance. Unlined valves will handle all common services such as air and water. For corrosive and abrasive fluids, sandy waters, sludges, slurries, etc., Crane supplies these valves with tough neoprene lining. Valves exposed to rock slides or abrasive dust can be ordered with a cap to protect stem threads as shown here.

### CATALOG FREE ON REQUEST

See the complete showing of new Crane diaphragm valves—unlined, with screwed ends, in sizes  $\frac{1}{2}$  to 2 in.; with flanged ends,  $\frac{1}{2}$  to 4 in. Neoprene-lined valves—flanged ends only—in sizes from  $\frac{1}{2}$  to 4 in. Ask your Crane Salesman—or write direct—for Catalog AD-1761.

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Branches and Wholesalers Serving All Industrial Areas

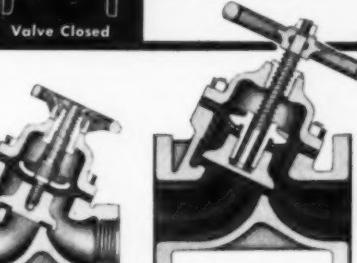
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VALVES  
FITTINGS  
PIPE

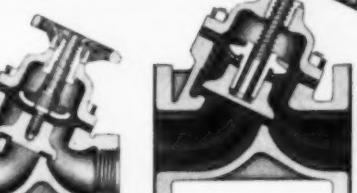
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FOR EVERY PIPING SYSTEM

PLUMBING  
AND  
HEATING



Cross-section, No. 1610,  
unlined, screwed ends.



Cross-section  
No. 1613, neoprene-lined.  
 $\frac{1}{2}$ , 3 and 4-in. sizes.



No. 1611, unlined,  
flanged ends.

**WORKING PRESSURE:**  
150 Pounds  
water, oil, air or gas  
180 Deg. F.  
maximum temperature

### HOW IT WORKS



The Crane diaphragm serves one function only—sealing the bonnet. It is not subject to crushing and rapid wear. The seating member is a separate circular flat face disc, firmly attached to the stem and joined to the diaphragm with a special leakproof connection. This independent seating feature permits positive shut-off with no loss of fluid, even in case of diaphragm failure.



CRANE



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# MAKE UNLOADING COAL EASY

Freezeproof it with

**WYANDOTTE  
CALCIUM CHLORIDE**

• Coal frozen in the car means lost delivery time and extra labor . . . dissatisfaction on the part of your dealers . . . deterioration of your product. And it's so simple and cheap to avoid all this! Just freezeproof your coal shipments with Wyandotte Calcium Chloride.

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## Army Lets Contract for Synthetic-Fuels Survey

A \$1,350,000 contract for a survey in 37 states and Alaska "to determine suitable general areas for the manufacture of synthetic liquid fuels" has been awarded by the Army to Ford, Bacon & Davis, Inc., engineers, New York City. The survey will follow a sample survey made some months back to determine techniques and methods. Sub-contracting will be done by the following: Paul Weir Co., Chicago, for the coal survey; DeGolyer & MacNaughton, Dallas, Tex., for oil shale and natural gas surveys; Max W. Ball, Washington, for a survey of oil-impregnated stripable deposits; and Malcolm Pirnie Engineers, New York City, for a survey of water supply.

The Army will not select specific sites for synthetic-liquid-fuel plants, that responsibility being reserved by law to the Bureau of Mines, which has over-all supervision of synthetic fuels. However, the Army survey will gather data on the availability of raw materials, water supply, power, transportation, labor, housing and markets. The Geological Survey and the Bureau of Reclamation will provide consultant services. The Bureau of Mines will make all final decisions.

## Strip Electrical Men Form Midwest Group

Over 110 electrical experts connected with strip mining in Indiana, Illinois and Michigan have formed a new division within the Open-Pit Mining Association. The organization meeting was held at Lafayette, Ind., July 24, with Purdue University as host to the group.

Officers were elected as follows: president, Charles A. Osborne, chief electrician, Sunlight Coal Co., Boonville, Ind.; vice president, John G. Price, chief electrician, Ayrshire Collieries Co., Oakland City, Ind.; and secretary-treasurer, L. E. Briscoe, electrical engineer, Ayrshire Collieries Co., Indianapolis, Ind.

## Foreign Developments



**AUSTRALIA**—The end of the Communist-led strike of Australian coal miners was reported Aug. 10 when

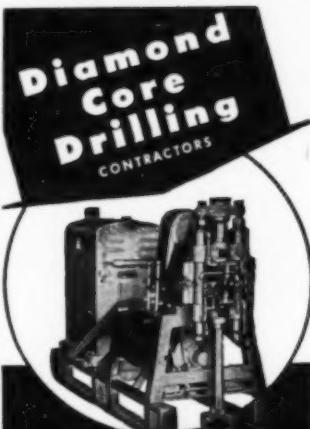
**MESCOWELD  
RAIL BONDS  
Shipped AT ONCE  
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There are no annoying delays when you ask for MESCOWELD Rail Bonds. Our ample stocks allow us to fill your order immediately after we receive it. 18 standard types available. Write, or phone Hemlock 8332, for complete details.

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Testing mineral properties with our light gasoline drills. SATISFACTORY COAL CORES GUARANTEED. Ground solidification by our pre-pressure grouting method for shafts. Wet mine areas, horizontal holes for drainage. Electric drills for inside mine drilling.

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# 38-B

## ... Coal Seam Standout



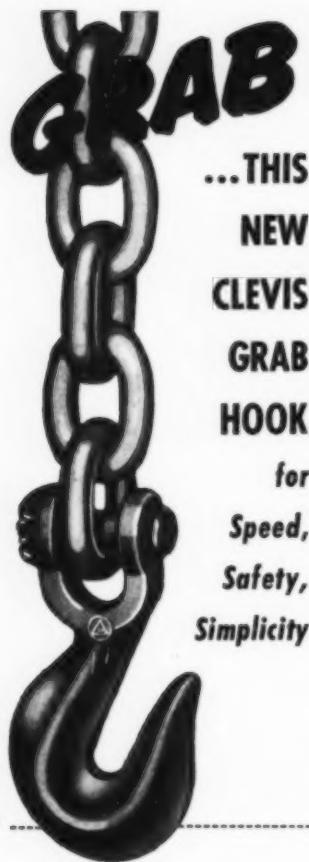
Put a Bucyrus-Erie 38-B shovel on the seam and keep a steady high-volume flow of coal moving to the tipple. That's what more and more mine operators are doing because they've found that the 38-B's amazingly fast operating cycle, powerful digging action, and great strength combine to produce high, sustained output.

Find out how this fast-paced shovel can help you move more coal from seam to tipple every shift. You'll want to know about the 38-B's fine balance of speeds and power, its smooth easy control, its tough durable construction, and its special 2 1/4-yd. coal-loading dipper. You, too, will be convinced that the 38-B is a coal seam standout.

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ERIE**

*Always Tops  
in Output*

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**...THIS  
NEW  
CLEVIS  
GRAB  
HOOK  
for  
Speed,  
Safety,  
Simplicity**

Here's a new one—a rugged, heat-treated, forged hook with a jaw that's quickly attached to any chain.

**Slip the pin through the clevis;  
Spread the cotter**

... and you've made a better, stronger connection in nothing flat. Super-safe, too—forged housing protects workers from projecting cotter pin.

Lauhlin Clevis Grab Hooks do away with shackling . . . cold-shutting . . . cutting, bending and rewelding the chain. Easily changed from job to job.

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THE MOST COMPLETE LINE OF DRAFFERED WIRE ROPE AND CHAIN FITTINGS



the rank-and-file workers throughout the country defied their leaders and voted more than two to one to return to work. Begun June 27 in the middle of the Australian winter (*Coal Age*, August, p 160), the strike had succeeded in paralyzing the nation's economy and throwing some hundreds of thousands of workers out of jobs. According to reports, the return-to-work vote was the first time in history that the miners themselves had gone against the proposals of their union's officers. In a last-minute attempt to rally support, union officials had scheduled mass meetings in mining areas but in many cases were shouted down by the workers.

An undisclosed American engineering firm reportedly has submitted a proposal to invest \$25 million in the construction of a 130-mi belt conveyor to transport coal from the new Blair Athol, Queensland, open-pit development to the Pacific Coast. The English utility company, which two years ago obtained a franchise for development of the rich deposits, has had under consideration two alternate routes for the construction of a railway to haul 3,000,000 tons of coal annually, together with a harbor and modern coal-loading facilities but no decision has yet been reported. The belt conveyor, which would transverse the rough country in practically a beeline, has been proposed as a substitute for the railroad.

**CANADA**—A new wage agreement signed near the end of July by the Northern Alberta Coal Operators' Association and District 18, UMWA, provides for an increase from 5¢ to 15¢ per ton in operator payments into the miners' welfare fund. The new agreement affects some 650 miners. Officials of the six companies involved said there would be no increase in the price of coal. A similar agreement to increase the tonnage levy for the welfare fund was signed in southern Alberta in February.

Meanwhile, in Ottawa, the government was reported to be considering a proposal to boost coal-freight subsidies in an effort to help coal companies in the Maritime Provinces and western Canada to recapture some of the markets lost to American producers since the 1947 coal strike in Canada. Coal from the United States now can be sold cheaper in central Canada than coal from Nova Scotia, it is pointed out. First moves in the program, it is reported, will be to bring coal from western Canada to northern Ontario markets and Maritime coal, mainly from Nova Scotia, to Quebec markets. Canadian producers are planning to step up their sales campaigns as an assist to the government's program. To complicate their situation, Canadian coal producers also are faced with increasing competition from oil and natural gas.

A system of import permits for United States coal may be sought of

## BONDED COAL CRUSHERS



Take large lump feed and reduce it to your customers' specifications, in sizes ranging from  $\frac{1}{2}$ " to 8". Capacities . . . 20 to 500 tons per hour. Double roll and single roll models.

**PRICED FROM \$395.00**

## TRUCK SALES



Capacities 10 to 40 tons with platform sizes to 50 feet. Only Bonded has the patented one-piece, self-aligning bearing, assuring greater accuracy.

**15 Ton Scale, \$450.00  
20 Ton Scale, \$510.00**

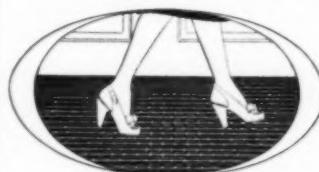
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Manufacturers of Scales, Conveyors, Conveyor Supplies, Idlers, Vibrating Screens, Crushers and Feeders.

## THE SAFE OPEN STEEL FLOORING IS TRI-LOK



No object over  $\frac{1}{2}$  square inch can pass through super-safe U-Type Tri-Lok Flooring. Fabricated without bolts, rivets or welds, it is unsurpassed for plant installation, walkways, loading platforms. Efficient distribution of concentrated loads . . . maximum free opening for light and air. Write for Bulletin JW1140.

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New Traction Drive with Forward and Reverse



THIS UNIT IS  
DELIVERING  
6 inch shot-holes  
READY FOR LOADING  
at better than  
**A FOOT A MINUTE!!**

The new Parmanco Hi-Speed Horizontal Drill is completely redesigned around a 40 h. p. engine with four drilling speeds which, in field tests, has cut one-third off the footage drilling time—a cost-per-drilling-foot saving that we are passing on to the strip mine operator and contractor at no increase in our price. In addition, the drill is equipped with a starter and generator, dual type front wheels, truck type rear axle with mechanical brakes and a traction drive with both forward and reverse.

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**For Bearings that carry heavy loads ...**

**withstand shock...run cool at high speeds**

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THE COPPERED BABBITT

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the Canadian government by the Dominion Coal Board. With the increase in western output of crude oil and natural gas, Alberta coal operators reportedly have become much more interested in the Ontario market for coal. The board is said to believe that Alberta coal can be sold in Northern Ontario on a competitive basis with American coal and in such a case import restrictions would not be needed. Any plan to increase coal costs in Ontario to save American dollars, however, would be criticized not only by Ontario coal importers but by users as well.

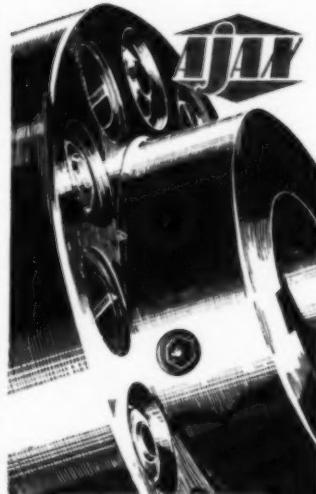
**AFRICA**—The new Tete railway, recently opened at a construction cost of about £4,000,000, is expected to open up development of coal fields at Moatize, in Mozambique, Portuguese East Africa, for a yearly production of 300,000 tons. Bunker coal, as well as coal for export, are to be made available at Beira.

**INDIA**—Surveys looking to a synthetic-liquid-fuels program for India have called for alternate plants costing \$70,000,000 and \$120,000,000. The Council of Scientific & Industrial Research has recommended to the government that pilot-plant investigations be conducted in India. Previously, Indian coal has been shipped to the United States for testing and experimental work.

### Coal Publications

Carbonizing Properties of Beckley-Bed Coal from Stanaford No. 1 mine, Mt. Hope, Raleigh County, W. Va., by J. D. Davis, D. A. Reynolds, D. E. Wolfson, W. H. Ode, R. E. Brewer and G. W. Birge. U. S. Bureau of Mines, T. P. 712, 15c, Superintendent of Documents, Government Printing Office, Washington 25, D. C. Coal from the Beckley bed in West Virginia can be used successfully as a blending coal in making metallurgical coke, thus augmenting the Pocahontas blending coals as they become depleted. Reserves of the Beckley bed, largely low-volatile, are estimated at over 2 billion tons.

Report of Research and Technologic Work on Explosives, Explosions and Flames: Fiscal Years 1947 and 1948, by Bernard Lewis. U. S. Bureau of Mines, R. I. 4502, 92 pp. plus 71 pp. of charts and illustrations. 8x10½-in.; mimeo. Free. Publications Distribution Section, 4800 Forbes St., Pittsburgh, Pa. Complete summary of bureau research and technical studies from July 1, 1946, to June 30, 1948, covering various types of explosives, flammability of gases and vapors, laboratory and gallery tests and demonstrations, recommendations for greater safety and a list of projects undertaken for agencies outside the Bureau of Mines.



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### . . . of Buying Information

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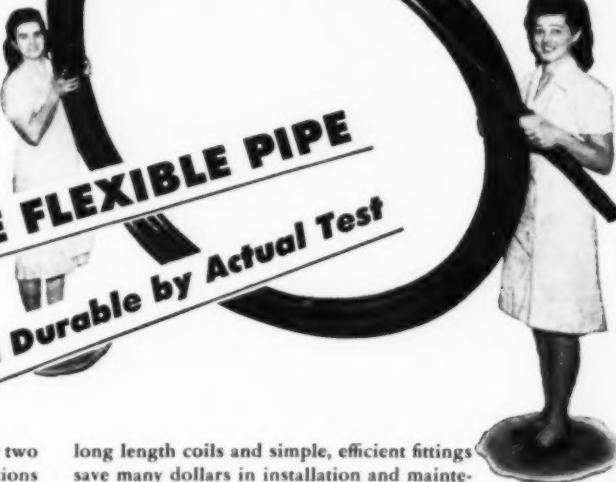
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**Operating Cost Guide for Power Shovels, Hoes, Draglines, Clamshells and Cranes:** Technical Bulletin No. 2, Power Crane & Shovel Association, 74 Trinity Place, New York City 6. 23 pp. 8½x11-in; paper. 50c. How to estimate cost of ownership, operation and maintenance.

**Mechanical Mining in Some Bituminous Coal Mines: Progress Report 3—Extraction of Pillars with Mechanized Equipment,** by L. A. Turnbull and A. L. Toenges. U. S. Bureau of Mines, I. C. 7527. 59 pp plus 25 pp of illustrations. 8x10½-in; paper; mimeo. Free. Publications Distribution Section, 4800 Forbes St., Pittsburgh, Pa. Operating data from 55 mines show the biggest problem in pillar extraction is control of roof. However, speed and regularity in extrac-

tion generally makes it possible to obtain regular breaks in overlying strata along established pillar lines. It is urged that more mines undertake pillar extraction to boost the over-all percentage of recovery.

**Burning Washington Coals on Different Types of Domestic Stokers in the Same Hot-Water Boilers: Comparison with Hand and Oil Firing,** by H. F. Yancey, K. A. Johnson, J. B. Cordiner Jr. and K. E. Lunde. 30c. Supt. of Documents, Government Printing Office, Washington 25, D. C. Running 166 burning trials in three domestic stokers on 19 different coals ranging from lignite to semi-anthracite, with various feed rates and under different operating conditions, showed that coal was just as efficient as oil, or, in some cases, only slightly

less so. Efficiency reached a maximum of 78% with coal and 80% with oil.

Three pamphlets recently issued from the Coal Research Laboratory, Carnegie Institute of Technology, Pittsburgh, Pa., are listed below. All are paper-bound, 6x9 in. Single copies free on request; additional copies 25¢ each.

**Contribution 149: Chemical Nature of Coal Hydrogenation Products, II,** by A. N. Basu and R. A. Glenn. 11 pp.

**Contribution 154: Effects of Temperature on the Hydrogenation of Certain Bituminous Coals,** by R. A. Glenn. 24 pp.

**Contribution 155: Coke Ash and Coke Sulfur in the Blast Furnace,** by H. H. Lowry. 22 pp.

Below are listed pamphlets recently issued by the American Management Association, 330 West 42d St., New York 18, N. Y. All pamphlets are 6x9 in, paper-bound. Unless noted otherwise, price is 75¢ per copy.

#### Production Series:

No. 178: New Controls for Fixed and Variable Costs. 39 pp.

No. 179: Building Quality into Manpower. Use of attitude surveys, committee management and selection of executive and supervisory force. 35 pp.

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No. 182: The Basis of Production Planning. Policies of the National Munitions Board. 24 pp. 50c.

No. 183: Building Worker Interest in Production Problems. Using worker suggestions and getting the customer viewpoint over to supervisors. 34 pp.

No. 184: Organizational Teamwork in Production. Developments in materials handling, design control, coordination of production and sales, flexibility in production. 32 pp.

#### General Management Series:

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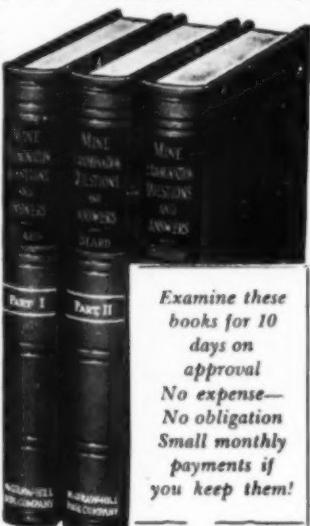
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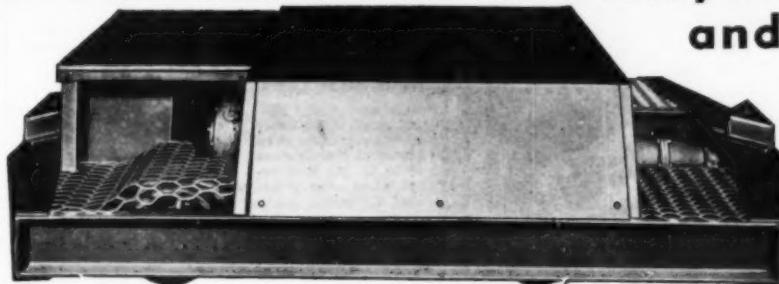
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42"	5	1/8"	1/16"
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30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
26"	5	1/8"	1/32"
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16"	6	10"	5	5"	5	5"	5
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1"	25 "	—
	50 "	—
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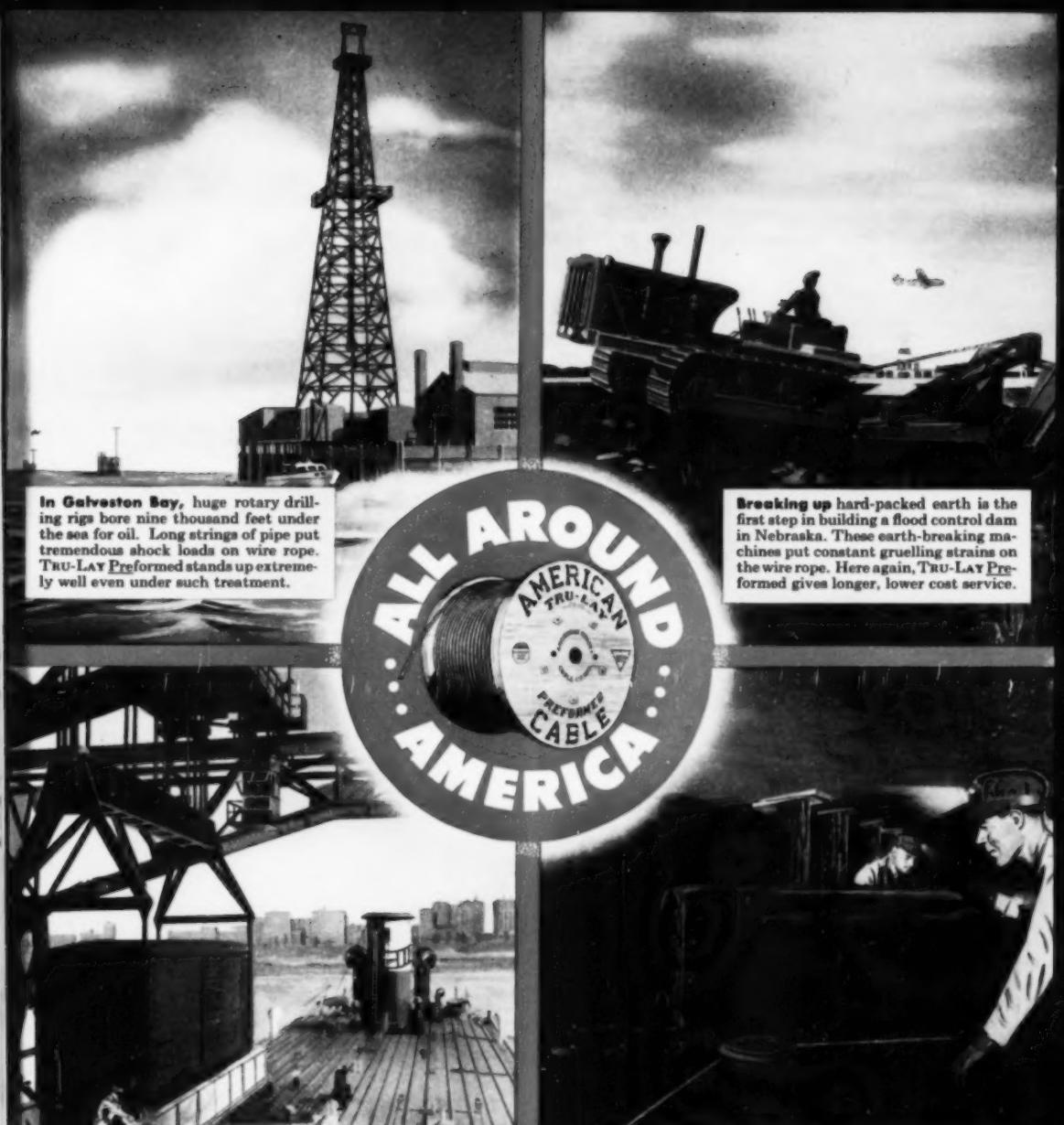
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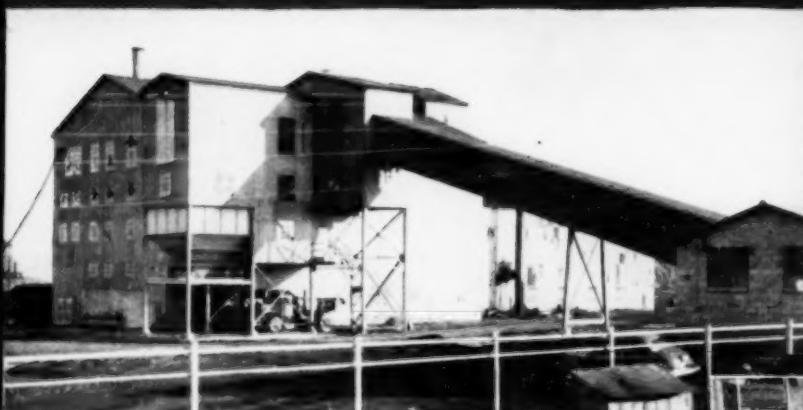


Photo at right shows Link-Belt two-compartment oscillating conveyors. Center: Link-Belt air-pulsated washer. Bottom: 43 station control board.

## Link-Belt plant design features dual circuits

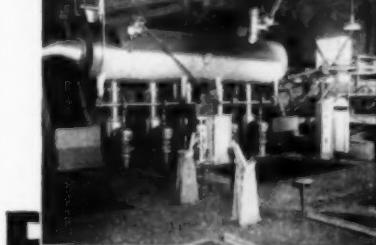
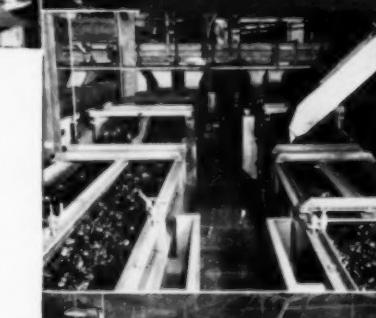
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